Cultivating Intimate Partner Violence Screening in the Primary Care Setting:

A Quality Improvement Project

Submitted by

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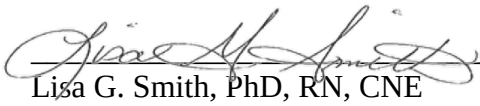

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Date

Abstract

Intimate partner violence (IPV) is prevalent in all ages, races, and socioeconomic classes. Screening all women ages 14–46, regardless of risk factors or symptoms, can improve health outcomes. The purpose of this project was to improve IPV identification and assess the efficacy of a multimodal intervention to increase primary care providers' (PCPs) clinical practice compliance with screening practice recommendations. The RE-AIM framework (reach, effectiveness, adoption, implementation, and maintenance) was used to support the implementation of existing evidence-based IPV screening research into a clinical practice. A quasi-experimental, quantitative, uncontrolled pretest–posttest design was used with 16 PCPs to evaluate whether the implementation of an IPV educational session, an EMR reminder alert, and an evidence-based IPV screening tool (Hurt Insult Threaten Scream) increased IPV identification and screening rates in women of childbearing ages 14–46. A 30-day pre- and postintervention EMR chart review was used to quantify the proportion of women of childbearing age experiencing IPV who were screened. The overall screening rate jumped from 0% in the preintervention period to 38% in the postintervention period, with 4 women identified for IPV. Using a Wilcoxon rank sum test, the increased screening was statistically significant (p=0.00082, V=91). Due to the small number of IPV cases identified, no statistical testing was performed on this data. Practice recommendations include making yearly IPV training mandatory for all PCPs, developing an evidence-based Canadian IPV educational toolkit, and creating an IPV screening guideline for use in the primary care practice setting.

Keywords: intimate partner violence, IPV, screening, provider education, electronic medical records alerts, electronic medical records tools

Dedication

This quality improvement project is dedicated to all the women who have lost their lives or loved ones, or who are living in intimate partner violence. The silence is broken!

This project also would not have been possible without the boundless support from my wonderful parents, Ashley and Elke. To my son Thayne, I love you and hope that the endless hours you saw Mommy on the computer, frustrated or defeated, you will see that hard work, dedication, and sticking to it pays off—anything is possible!

To my friends and fellow DNP committee members David, Jenny, and Joyce, thanks for all the support, encouragement, and honesty. You provided me the focus, strength, and want to continue on my academic journey to achieving a doctorate!

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Chapter 1: Introduction to the Project

Intimate partner violence (IPV) is a complex issue that is prevalent in every community. The pervasiveness of IPV is widespread, affecting women, men, and children of all ethnical backgrounds globally (Centers for Disease Control [CDC], 2017). Declared a public health problem, IPV has heavily weighted adverse physical, and mental health outcomes including mortality to its victims and the health care system. Victims of violence require public health attention and strategies to respond to violence accordingly while managing the significant health implications. Encounters with IPV have impactful sequelae of physical and mental health consequences, leading to costly needs for specialized medical services (CDC, 2017). Intimate partner violence involving women is one of the most common types of violence, including physical, sexual, and psychological abuse, driven by controlling behaviors with an intimate partner. Women who have endured IPV or are living in violence are recognized as an at-risk population by the World Health Organization (WHO, 2012). This at-risk population has been found to have poorer health outcomes compared to non-abused women as they tend not to readily engage in consistent health care practices (Sprague et al., 2016). The literature has demonstrated that earlier identification of victims through IPV screening improves health outcomes and decreases cost to the health care system (Curry et al., 2018).

The relevance of IPV is significant as almost all health care professionals encounter victims of violence during their health care career (Sprague et al., 2016). Without identification of IPV through screening, victims suffer in silence with the potential of physical and mental health consequences. Intimate partner violence screening is recognized and strongly recommended by many health care professionals as an initial and essential approach in identifying and responding to victims of violence (Curry et al.,

2018; Sprague et al., 2016). The United States Preventive Services Task Force (USPSTF) endorses IPV screening of all women who are of childbearing age ranging from 14 to 46 (Curry et al., 2018; USPSTF, 2014). Recommendations to screen only women of childbearing age were extrapolated by the USPSTF from evidence in which it was found that IPV screening was most beneficial in populations of pregnant and post-partum women ages 14–46 (USPSTF, 2014). Despite the mass attention and the USPSTF evidence-based recommendations, IPV screening practices amongst primary care providers (PCPs) remains low and is not widely adopted throughout health care settings (Hamberger, Rhodes, & Brown, 2015). Prior research has indicated several barriers to IPV screening, including uncertainty around appropriate IPV screening tools, lack of education and training, and provider discomfort with IPV (Bressler, Brink, & Crichton, 2016; Raissi, Krentz, Siemieniuk, & Gill, 2015; Wood, 2016). Health care settings, such as primary care practices, require knowledgeable and trained PCPs who engage in robust IPV screening practices of women of childbearing age, regardless of recognized signs and symptoms of violence.

The purpose of this quality improvement (QI) project was to improve IPV identification and assess the efficacy of a multimodal intervention to increase clinical practice compliance with the 2018 USPSTF's IPV screening practice recommendations for women of childbearing ages 14–46 in a Canadian primary care facility (PCF) in Vancouver, British Columbia (BC), through the implementation of a same-day multimodal intervention. The same-day multimodal intervention included a 45-minute onsite evidence-based IPV education session for PCPs, creation of an electronic medical record (EMR) IPV screening alert, and use of the verbal Hurt Insult Threaten Scream (HITS) evidence-based IPV screening tool (see Appendix A; Shakil et al., 2014).

Permission was granted by the copyright holders to use the verbal HITS tool (see Appendix B).

Intimate partner violence screening rates and rates of IPV identification in women of childbearing ages 14–46 were evaluated for the 30-day period prior to the multimodal intervention to quantify baseline screening and IPV identification rates amongst women of childbearing ages 14–46 who attended the PCF. After the multimodal intervention, IPV screening and identification rates were reassessed during a second 30-day period using an EMR chart review. Participants' EMR charts of women of childbearing ages 14–46 who were seen for medical care during the QI project period (i.e., 30 days before the intervention and 30 days after) were assessed for the completion and the score of the verbal HITS IPV screening tool.

Enhancement of PCPs' IPV knowledge, confidence, and skill set can increase provider screening practices and, ultimately, identification of IPV victims (Hamberger et al., 2015). This project aimed to translate existing evidence-based IPV screening knowledge and tools into a Canadian PCF to improve IPV identification in women of childbearing age through the initiation of IPV screening. Ultimately, the onus of IPV screening is upon all providers in contact with individuals seeking health care. PCPs are in a unique position to improve health outcomes in women of childbearing age through IPV identification, with the adoption of IPV screening and use of evidence-based screening tools (Alvarez, Fedock, Grace, & Campbell, 2017). The RE-AIM (reach, effectiveness, adoption, implementation, and maintenance) framework (Glasgow, Vogt, & Boles, 1999) was used as it supported the implementation of existing evidence-based IPV screening research findings into a primary care clinical practice setting. Sections in this chapter include a background of the project, nature of the problem, advancements in

scientific knowledge, purpose, and significance of the project, including clinical questions, methodology rationale, definition of terms, assumptions, and limitations.

Background of the Project

Intimate partner violence is a global problem that has significant health costs to its victims and the health care system (CDC, 2017; Sprague et al., 2016). Women aged 40–48 (37.8%) have the highest prevalence of IPV globally, with the lowest age range being 55–59 (15.1%; WHO, 2013). This at-risk population remains underserved as they are challenged with accessing health care, seeking safety, and are faced with multiple health risks requiring immediate attention (CDC, 2017; Sprague et al., 2016). Intimate partner violence is borne by women and can be found in all settings, socioeconomic classes, and religious groups. Rates of IPV are highest in women with underlying mental health conditions who have a history of childhood trauma (Spivak et al., 2014; Widom, Czaja, & Dutton, 2014). Additional risk factors include pregnancy, poverty, homelessness, substance use disorders, homosexuality, joblessness, and residing in a lower income neighborhood (Buller, Devries, Howard, & Bacchus, 2014). Survivors of violence are at increased risk of physical, psychological, and reproductive ailments (CDC, 2017). PCPs will encounter victims of violence during their health care careers, especially in primary health care settings. Therefore, it is essential that all PCPs be knowledgeable and competent in identifying and managing victims of violence in the health care setting.

Intimate partner violence screening is recognized and strongly recommended by many as an initial and essential approach in identifying and responding to victims of violence (Curry et al., 2018; Sprague et al., 2016). The USPSTF endorses IPV screening to all women of childbearing age (Curry et al., 2018). Yet, rates of IPV screening completed by a physician or a nurse in a family practice or emergency room setting have

been found to be less than 2% (Hamberger et al., 2015). Significantly low IPV screening rates have been well documented in the literature due to time constraints, negative perceptions, lack of education, and lack of awareness of IPV screening tools (Wood, 2016). Moreover, unawareness on the part of PCPs of how best to manage disclosed IPV from the patient concerning available resources, lack of time to address IPV and safety planning, and discomfort with sensitive issues also impact IPV screening practices (Bressler et al., 2016; Raissi et al., 2015).

Screening in the health care setting increases the identification of patients experiencing IPV and can lead to moderately improved health outcomes (Curry et al., 2018; O'Doherty et al., 2015). PCPs play a significant role in IPV identification through screening in the primary care health care setting. Poor IPV knowledge and screening practices by PCPs have been identified as a critical gap in the principal investigator's current PCF in Canada. Without IPV screening in this clinical practice setting, victims of IPV are not identified or provided with appropriate interventions and resources, and are left with unmet health care needs (Curry et al., 2018). Increasing PCPs' IPV competence and familiarity, and improving IPV screening practices while working with women of childbearing age in this primary care setting, are vital.

Despite IPV being one of the most common forms of violence in Canada, IPV screening recommendations from the USPSTF were not endorsed by the Canadian Task Force on Health Care (Canadian Task Force on Preventive Health Care, 2013; Verma & Maleki, 2016). This QI project incorporated existing evidence-based knowledge that is known to identify IPV and improve IPV screening practice through IPV education, an EMR alert, and the use of the verbal HITS screening tool. Implementation of these three evidence-based interventions could better support and encourage practice changes within

the principal investigator's clinical practice setting. An evidence-based IPV onsite education session with the integration of EMR can supports the PCF and improve screening practices and identification of women who are victims of IPV at the PCF. Ultimately, screening for IPV in the health care setting leads to early identification of victims and referral to appropriate support and community resources (Ghandour, Campbell, & Lloyd, 2015; O'Doherty et al., 2015).

Problem Statement

Intimate partner violence is a serious global epidemic with adverse outcomes in many populations, especially women. Victims of interpersonal violence have significant health risks, poorer health outcomes, and increased risk of physical, psychological, and reproductive health ailments (CDC, 2017). Physical health risks of IPV include fibromyalgia, irritable bowel syndrome, chronic pain, sexually transmitted infections, and cardiovascular disease (CDC, 2017). WHO (2013) has also reported that 42% of women who had endured IPV had sustained physical injuries, 16% had a higher chance of having a low birth weight baby, spontaneous abortions were twice as common, and human immunodeficiency virus or syphilis was 1.5 times more likely. Lastly, women who have experienced IPV were also found to be more likely to have alcohol misuse disorders (2.3 times) and struggle with depression or anxiety (2.6 times; WHO, 2013). Psychological consequences of IPV include depression, anxiety, low self-esteem, posttraumatic stress disorder, and suicidal behaviors (CDC, 2017). The burden of such illnesses and health-related consequences to women who live in violence can be greatly reduced with interventions such as IPV screening. Screening is an important first step that is required to identify women who are at risk. Evidence suggests that providing support and

intervention for women who screen positive for IPV can reduce further violence and improve health outcomes (Curry et al., 2018).

Screening women of childbearing ages 14–46 for IPV has been found to be effective in early identification, thus leading to moderately improved health outcomes through engagement of support and intervention (Curry et al., 2018). Almost all health care professionals will come across victims of violence throughout their health care career (C. Sims et al., 2011). As IPV can have unrecognizable signs and symptoms, all women of childbearing ages 14–46 should be screened. The principal investigator has exhausted the literature and found the balance of benefits and harms of IPV screening cannot be determined (Curry et al., 2018). Therefore, identification of IPV in women of childbearing age through improved IPV screening practices within the PCF could have positive patient outcomes as supported in the literature.

Despite the USPSTF's (2018) Grade B evidence that women of childbearing age are screened for IPV regardless of signs or symptoms, the literature indicates such screening practices have not been widely adopted into the primary care practice setting (Curry et al., 2018; Hamberger et al., 2015). Grade B, the second-highest recommendation, is assigned when the USPSTF "recommends the service . . . [and] there is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial" (USPSTF, 2018, Grade definitions after July 2012 section). Reported barriers to IPV screening have included a lack of providers' IPV knowledge and a need for added support, education, and training in IPV within the health care setting (Bressler et al., 2016; Raissi et al., 2015). Prior studies have demonstrated that increasing a provider's IPV knowledge and use of alerts and IPV screening tools within an EMR improved screening practices thus identified victims of violence (Berger

et al., 2017; Haegerich, Sugerman, Annest, Klevens, & Baldwin, 2015; Sawyer, Coles, Williams, & Williams, 2016). Prior to this study, it was not known if the implementation of a multimodal intervention that includes an onsite PCP IPV educational session, an EMR IPV screening reminder alert, and the HITS IPV screening tool into a PCF would improve screening and identify IPV in women of childbearing ages 14–46. Increased IPV identification through screening in the principal investigator's PCF could be beneficial to women who otherwise would not receive the specialized care and community supports that have been demonstrated in the literature to be effective in reducing further violence and improving health outcomes (Curry et al., 2018).

Purpose of the Project

The purpose of this QI project was to improve IPV identification and assess the efficacy of a multimodal intervention to increase clinical practice compliance with the USPSTF's IPV screening practice recommendations for women of childbearing age within a PCF (Curry et al., 2018). Screening with the use of evidence-based tools for IPV has been shown to effectively identify IPV in women of childbearing age (Curry et al., 2018). Adoption of IPV screening tools and practices into the health care setting can improve IPV identification leading to improved health outcomes for women of childbearing age (Alvarez et al., 2017). The USPSTF (2018) has recommended all women of childbearing ages 14–46 visiting a PCF be screened for IPV using an evidence-based screening tool. However, at the PCF that participated in this project, no consistent IPV screening practices, policies, or processes existed. Therefore, women of childbearing age who attended the PCF were not being identified for IPV. With IPV identification of these women and appropriate intervention, physical and mental health improvements can be made. Quality improvement projects contribute to the development of health care

system best practices and support providers with up-to-date knowledge, evidence-based skill sets, and improved health outcomes (Silva, Warnakulasooriya, & Arachchige, 2016). A QI project was well suited for the clinical goal of improving IPV identification and compliance with the 2018 USPSTF's IPV screening recommendations.

This QI project quantified IPV screening and identification rates amongst women of childbearing age before and after a multimodal intervention was administered to PCPs at the PCF. Data collection occurred at baseline and at the end of a 30-day follow-up period, through a comprehensive review of participants' EMR charts of women aged 14–46. Informed consent was obtained beforehand from all PCPs participating in the multimodal intervention at the PCF. Permission to access EMR patient records was granted via the PCF's medical director and vice president; this project did not require the use of patients' personally identifying information or patient participation beyond standard care. International Research Board review was not required as this QI project qualified as Quality Improvement and/or Program Evaluation.

Women of childbearing age enduring IPV may be deemed a vulnerable population; however, the potential harms of IPV screening in this population cannot be determined (Curry et al., 2018). This QI project set out to increase PCP's clinical compliance with the 2018 USPSTF's IPV screening practice recommendations for women of childbearing age within a single Canadian PCF as it was determined that IPV identification and screening of women aged 14–46 by PCPs in the PCF was inadequate. The PCF participating in this project had no existing IPV screening practices, protocols, or policies. Improved IPV screening practices and IPV identification were assessed through the efficacy of a multimodal intervention.

This QI project sought to quantify the efficacy of a multimodal intervention on increasing the rate at which women of childbearing age were screened and identified for IPV. Existing literature has demonstrated positive patient health outcomes from IPV identification through screening, yet adoption in the clinical practice setting needed further compliance at the principal investigator's PCF. As well, the findings from this direct practice improvement project have generated hypotheses for further empirical research on IPV identification through screening while providing evidence of the statistical and clinical significance of these interventions to improve IPV screening practices in primary care clinical practice settings in Canada.

Clinical Questions

Screening for IPV in all women of childbearing age within the health care setting has been shown to be well received by female patients and positively improve patient health-related outcomes; so far, however, the literature demonstrates poor adoption of such screening practices in the health care setting (Curry et al., 2018; Hamberger et al., 2015). Despite the plethora of research on IPV screening tools, no gold standard has yet been established as to which screening tool best identifies IPV (Curry et al., 2018). This situation is further complicated with conflicting opinions on whether universally screening all women regardless of age and risk factors is beneficial (Feltner et al., 2018). For now, the USPSTF has recommended that health care professionals screen all women of childbearing ages 14–46 regardless of whether they show signs of abuse (Curry et al., 2018). The benefits of IPV screening include earlier identification of women at risk, provision of support services, and moderately improved health outcomes (O'Doherty et al., 2015).

As IPV screening within the principal investigator's practice setting was negligible at the time of this QI project, existing evidence-based methods such as IPV education, an EMR reminder alert, and an embedded IPV screening tool were implemented into the PCF to improve PCP screening practices and IPV identification. The principal investigator sought to improve the PCF's IPV screening practices and IPV identification by addressing common barriers to IPV screening cited in the literature through the implementation of a same-day multimodal intervention. Provider IPV education, electronic health care systems support, and an evidence-based screening tool were used to increase clinical practice compliance with the USPSTF's IPV screening practice recommendations for women of childbearing age within the PCF (Curry et al., 2018). The following questions guided this quantitative QI project:

Q1: Does implementation of a PCP IPV educational session, an EMR reminder alert, and an EMR IPV screening tool increase IPV screening rates and identification of IPV in women of childbearing ages 14–46?

Q2: Does IPV screening increase the rate of IPV identification in women of child bearing ages 14–46?

This same-day multimodal intervention took place in the principal investigator's PCF and was administered to all participating PCPs during their 60-minute lunch hour. The multimodal intervention included an onsite evidence-based IPV screening education session for PCPs, an EMR IPV screening alert, and an EMR integrated IPV screening tool. The IPV onsite educational session was defined as a 45-minute presentation at the PCF to PCPs through an evidence-based IPV education session using the USPSTF's final recommendation statements (Curry et al., 2018). The USPSTF's evidence-based recommendation statements, which were used with permission (see Appendix C), are

intended for PCPs' use and provided guidance for integration of the recommendation on IPV screening into the clinical practice setting (Curry et al., 2018). Participant PCPs were also educated on the use of the verbal HITS screening tool, scoring of the HITS, and next steps when a positive HITS score was found.

The IPV screening alert reminder was added to the current EMR system, prompting the participant PCP to screen for IPV if the patient was aged 14 to 46 (Curry et al., 2018). PCPs could then initiate the verbal HITS screening tool that was embedded within the EMR system at the PCF. The outcomes of interest were the proportion of women of childbearing age screened for IPV at the participating PCF in Vancouver, BC, Canada, and the proportion of women of childbearing age with a positive IPV identification. These QI project questions quantified the effectiveness of the multimodal intervention on increasing the rate at which IPV is screened for and identified in women of childbearing ages 14–46 at the PCF.

Advancing Scientific Knowledge

Quality improvement projects are important in evolving health care systems through evidence-based applications, improving health outcomes, and keeping providers' clinical practice up to date (Silva et al., 2016). Curry et al. (2018) have identified the benefits of IPV screening in women of childbearing age yet the adoption of such practices in the health setting amongst PCPs remains alarmingly low. Increasing clinical practice compliance with the 2018 USPSTF's IPV screening practice recommendations for women of childbearing age was identified as a necessary QI in order to identify IPV and intervene at the principal investigator's clinical practice setting. This QI project aimed to identify IPV by improving IPV screening adherence through evidence-based education and use of EMR systems supports, which have been found to be effective in

other clinical settings (Bender, 2016; Berger et al., 2017). Ongoing sustainability past the time frame of this QI project could lead to continued IPV screening practices within the primary care setting and ultimately improved population health in women of childbearing age who visit the PCF.

In order to enact changes to improve IPV screening at the PCF, participant PCPs were required to adopt new screening processes and use EMR support systems. Two theoretical foundations were used: the theory of reasoned action and game theory. The theory of reasoned action helped to explain and identify barriers to PCPs being proactive and following through with IPV screening practices for their female patients of childbearing age. The theory of reasoned action explains the PCPs' actions by examining their behaviors and attitudes regarding IPV. Their personal beliefs about IPV may correlate with their ability to act, such as screening for IPV or talking to a victim. This theory states that a PCP with stronger intentions would have a higher likelihood of performing the required behavior (Fishbein, 2008). Therefore, the stronger the intention, the higher the probability the PCP would screen, educate, and provide appropriate resources to women ages 14–46 who attend the PCF. Such health promotion and prevention activities are important for PCPs caring for female clients who access care within the PCF, as there is a small window of opportunity. The principal investigator explored the PCPs' beliefs and opinions about IPV with factual, evidence-based IPV education during the 45-minute education session intervention.

Game theory can be used to evaluate the interaction between a victim of violence and the health care professional conducting IPV screening (Soonok, Jisung, & Larry, 2016). Game theory helps to understand and describe strategic interactions and the associated outcomes of these interactions between the patient and health care

professional. Strategic human interaction is explained when behavior is exhibited in relationship to anticipating another's behavior or response. Therefore, game theory demonstrates that behaviors among individuals are interrelated. This theory was useful as it could be applied to understanding social interactions between the IPV screener and the patient. Game theory can be used to help explain interactions and outcomes between patients and providers during IPV screening (Soonok et al., 2016). The principal investigator learned from this theory when the PCPs engaged in IPV screening practices using the verbal HITS with their patients. Patients at the PCF who were seen by participating PCPs during the QI period either chose to disclose IPV and be referred for additional supports and services or not.

Significance of the Project

IPV is often unrecognizable, and the burden of disease is heavily weighted on women. As a significant global health problem, it requires health professionals and organizations to have robust IPV screening practices and policies. The literature has demonstrated that in women of childbearing age, IPV screening and interventions are connected to moderate health improvements through the reduction of exposure to abuse, as well as physical and mental harms and mortality (Curry et al., 2018). Therefore, PCPs' adoption of IPV screening practices has the potential to identify women of childbearing age who are victims of IPV and increase clinical practice compliance with the 2018 USPSTF's IPV screening practice recommendations within a PCF (Curry et al., 2018). Identification of IPV through screening is fundamental as it can reduce future IPV, improve physical and mental harms, and decrease mortality rates (Curry et al., 2018).

The literature indicates that many U.S. states have formal policies and stated requirements for mandated IPV screening (Dagher, Garza, & Kozhimannil, 2014). Other

countries have adopted legislation that requires mandatory reporting of IPV or suspected cases to the justice system or police (Vatnar, Leer-Salvesen, & Bjørkly, 2019). Canada has not followed suit, lacking a formal policy and poorly adopted IPV screening practices in health care settings, even though the prevalence of IPV has been well documented as problematic in Canada (Burczycka, 2016). The relevance of IPV is significant as all health care professionals will encounter victims of violence at some point during their health care career (Sprague et al., 2016). The literature indicates that early identification of IPV through screening and intervention can improve health outcomes (Curry et al., 2018). Contrary to Canada's limited IPV policies, various health care organizations in the U.S. and elsewhere have implemented IPV training, IPV screening protocols, and policies (Dagher et al., 2014). However, despite the recommendations for IPV screening by Curry et al. (2018), screening rates remain less than desirable considering IPV's global prevalence in the primary health care setting (Hamberger et al., 2015).

Common barriers to IPV screening are time, the health care professional's negative perceptions, lack of education, and lack of awareness of IPV screening tools (Wood, 2016). Implementation of IPV programs in the health care setting could increase provider screening practices and identification of IPV victims (Hamberger et al., 2015). The use of EMR supports such as alerts and templates have also been shown to improve IPV screening adherence (Bae, Ford, Kharrazi, & Huerta, 2018; Carey et al., 2015; Onders, Spillane, Reilley, & Leston, 2014). Increasing PCPs' knowledge about IPV and the implementation of an EMR alert and HITS screening tool into a PCF could identify victims of violence and improve providers' confidence, familiarity, and use of IPV screening (Bae et al., 2018). Improved identification of IPV victims through robust screening practices within the PCF could lead to future physical and mental health

betterment in patients who are women of childbearing age. This QI project highlighted a current gap in research and recommendation for change within a PCF in BC, Canada.

Rationale for Methodology

Quantitative methodology was used in a nonrandomized, quasi-experimental, uncontrolled pretest–posttest design to measure the relationship between the QI project's independent and dependent variables. Measurement was necessary to validate (or question) existing theories that were used to support this QI project. The goal of the analysis was to quantify the effect of the multimodal intervention on IPV screening and detection rates at the participating PCF. Quantitative methodologies interpret numerical data results and determine statistical significance through statistical analysis, exploring whether a mathematical relationship exists among independent and dependent variables (Zaccagnini & White, 2015). The ability to statistically analyze the data provided accuracy when analyzing the final numerical results. Analysis of the numerical data focused on quantifying the impact of the intervention on the screening and identification rates of IPV in women of childbearing age. Data were analyzed using the R language and environment for statistical computing version 3.6.1 (The R Foundation, n.d.-a; n.d.-b). This QI project aimed to determine if a statistical relationship existed between the multimodal interventions, which included an IPV educational session, an EMR IPV screening reminder alert, and an EMR IPV screening tool, and IPV screening rates and detection amongst PCPs who provided care for women ages 14–46 at a single PCF site.

Qualitative methods assess a phenomenon from the perceptions of those who have experienced it, describe behaviors, or evaluate lived experiences (Zaccagnini & White, 2015). Use of a qualitative design was not appropriate as it was not the purpose of the QI project to assess a phenomenon from perceptions. The use of a quantitative methodology

best fit this QI project as it supported reliable and credible statistical analysis of the numerical data, the prescribed time frame given, and the two clinical questions being examined.

The chosen methodology may be subject to bias in the form of participation bias, or the Hawthorne effect (Simundic, 2013). Results from this project may not be generalizable to all PCFs due to the high engagement seen from the PCPs and management of the PCF (participation bias). Other facilities may not have the same degree of engagement of PCPs, potentially leading to a lower degree of participation in a similar QI project, leading to lower rates of IPV identification and lower adoption of screening practices. In this study, a significant increase in IPV screening was observed, which may have been due to participation in the project alone (Hawthorne effect), as the PCPs were aware that their EMR charts were being reviewed for this QI project. These forms of bias are common issues in QI work (Wells et al., 2018) and make it difficult for the principal investigator to show a causal effect of the intervention that could be generalized to other PCFs. As a result, the analysis is primarily exploratory. The principal investigator has strived to quantify the effect of the intervention while generating hypotheses for future QI projects.

Nature of the Project Design

The selected design for this scholarly QI project was a nonrandomized quasi-experimental, uncontrolled pretest–posttest design which evaluated the impact of the multimodal interventions on the rate at which women of childbearing age were identified and screened for IPV. This design has been commonly applied in QI research and was appealing as it allowed the principal investigator to assess the impact of the intervention without requiring randomization or a control group (Frey, 2018; Portela, Pronovost,

Woodcock, Carter, & Dixon-Woods, 2015). Given that this project was conducted with a single PCF, it would not have been feasible for only a proportion of PCPs to receive the intervention and others not. As multiple PCPs may work collaboratively with each patient, it would have been difficult to compare the screening rate for PCPs who did or did not receive the intervention without substantial manipulation of scheduling. Therefore, in this setting, the nonrandomized quasi-experimental uncontrolled pretest–posttest design was ideal for exploring the clinical questions.

The QI project consisted of three phases: baseline, intervention, and follow-up (see Figure 1). During the baseline phase of the QI project, the principal investigator conducted a comprehensive EMR chart review to assess current screening and IPV identification rates among participating PCPs. Next, all consenting PCPs participated in the multimodal intervention consisting of an onsite IPV screening education session, an EMR IPV screening alert, and deployment of an EMR integrated IPV screening tool. After the follow-up period of 30 days, another comprehensive EMR chart review assessed the rate of IPV screening and IPV identification after the intervention. The second comprehensive chart review quantified with certainty the proportion of women of childbearing age who were screened and identified for IPV using the newly implemented EMR integrated screening tool.

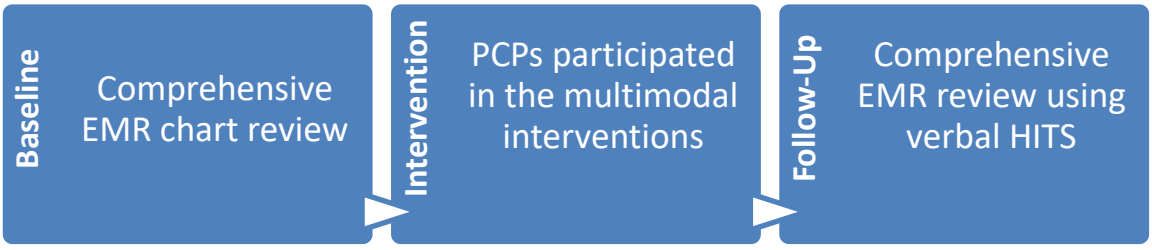

Figure 1. Flow chart detailing the three main phases of this QI project.

The multimodal intervention was administered to all participating PCP staff at the PCF and consisted of the implementation of an onsite IPV screening education session for PCPs, an EMR IPV screening alert, and deployment of an EMR integrated IPV screening tool. The IPV onsite educational session was defined as a 45-minute presentation at the PCF to PCPs through an evidence-based IPV education session using the USPSTF's final recommendation statements (Curry et al., 2018). After the 45-minute onsite evidence-based education intervention, participating PCPs resumed their regular work duties. The IPV screening alert reminder was added to the current EMR system and alerted the PCP to screen for IPV if the patient was of childbearing age (ages 14 to 46). PCPs could then initiate the verbal HITS IPV screening tool that was embedded in the EMR at the time of the project. This multimodal intervention was chosen to counteract cited barriers to IPV screening found in the literature.

Data analysis was conducted using the R language and environment for statistical computing version 3.6.1 (The R Foundation, n.d.-a; n.d.-b). The analysis focused on quantifying the impact of the intervention on the screening and identification rates of IPV in women of childbearing age. In particular, to analyze data for the first clinical question, comparison of the pretest and posttest screening proportions was calculated using a *z*-test. Similarly, for the second clinical question, comparison of the pretest and posttest identification rates was calculated using a *z*-test.

Definition of Terms

Definition of terms provides a description and explanation of key terms used in this QI project. This section contains terms and definitions that were used operationally. The following terms were used throughout this project and are presented in alphabetical order.

Hurt insult threaten scream (HITS). HITS is defined as a screening tool that PCPs administer verbally to assess a woman's risk for IPV. Four verbal questions are asked on whether the patient's partner hurts, insults, threatens, or screams at her. A single, positive "yes" answer to any of the four questions is required to quantify a positive IPV screen (Shakil et al., 2014). Permission to use this screening tool was granted by the copyright holder (K. M. Sherin, personal communication, July 2, 2019; see Appendix B).

Intimate partner violence (IPV). A term used to describe a form of violence where one partner exerts physical, sexual, psychological, or stalking harm against another past or present partner. Sexual intimacy is unnecessary; an intimate partner can be anyone. Intimate partner violence may occur between heterosexual or same-sex couples, and cohabitation may or may not be a factor and is not required (Breiding, Basile, Smith, Black, & Mahendra, 2015).

Multimodal intervention. A term used to describe multiple interventions that are initiated together. For the purpose of this QI project, the multimodal interventions consisted of IPV education, an IPV screening alert, and the HITS IPV screening tool.

Primary care facility (PCF). The PCF in Vancouver, BC, Canada, has a collaborative team of specialized health care professionals who provide a wide selection of health care services to individuals, corporate clients, and family members of any gender and all ages and ethnicities. Primary care services at the facility focus on early prevention and detection of diseases through care provided by physicians, psychologists, nurse practitioners, registered nurses, dietitians, physiotherapists, pharmacists, and kinesiologists. The QI project was implemented, evaluated, and analyzed at the PCF.

Primary care provider (PCP). A term that includes health care providers such as family physicians, registered nurses, and nurse practitioners who are licensed and trained to deliver health care–related services to patients for medical reasons (Peckham, Ho, & Marchildon, 2018). For the purpose of this project, the majority of the PCP population was family physicians, as they are the most common health care provider at the private primary care clinical setting in which this project took place.

Women of childbearing age. The USPTSF (2018) has defined women of childbearing age to be within the reproductive ages of 14 and 46. Other research has stated that women of childbearing age are simply 18 years of age and older (Curry et al., 2018). For the purpose of this QI project, women were screened for IPV if they attended the PCF during the intervention and were aged from 14 to 46.

Assumptions, Limitations, Delimitations

This section identifies assumptions, limitations, and delimitations in order to better clarify and frame the principal investigator's QI project. Assumptions are beliefs that are necessary in order to complete the project. Limitations are possible restraints to the project that can affect outcomes, and delimitations are defined boundaries consciously made by the researcher (Simon & Goes, 2013).

Assumptions. At the time of the QI project, the USPSTF (2018) had yet to make any new recommendations or changes on IPV screening in women of childbearing age since its last reviews in 2013 and 2018. In addition, the Canadian Task Force on Preventive Health Care (2013) had not endorsed the USPSTF IPV screening recommendations in Canada. Therefore, it was assumed that since significant time had passed since the initial review release, and the task force had not recommended IPV

screening, these evidence-based IPV screening recommendations would not be known, remembered, or followed by the PCF site PCPs.

It was also assumed that IPV screening would be seen as a choice, not a necessity or requirement, amongst the participating PCPs given that Canada has not formally adopted IPV guidelines or policies. In contrast, the Joint Commission in the United States requires all accredited medical organizations to have written policies and procedures, and mandatory staff training on IPV (Miller, McCaw, Humphreys, & Mitchell, 2015; Williams, Halstead, Salani, & Koermer, 2016). Some U.S. states have gone as far as making IPV screening a legal requirement (Canadian Task Force on Preventive Health Care, 2013; Hamberger et al., 2015). Therefore, it was assumed that PCPs at the PCF were not currently consistently screening for IPV in women ages 14–46 within their practices, nor were there policies in place to support IPV screening. This also led the principal investigator to assume that there was a general lack of IPV knowledge, potential discomfort with IPV screening, and lack of educational training that would potentiate screening avoidance and adherence.

As the clinical practice setting in which this QI project was implemented has been marketed as a prevention-focused, evidence-based clinical practice setting, it was assumed that the implementation and integration of the IPV screening would be well-received and seen to add value to the other health-related prevention screenings that were already taking place. It was assumed that the implementation of IPV screening would be seen as primary prevention within the clinical practice setting. Participation in the QI project was maximized at the project site as the PCF's management provided time for participation.

Limitations. Potential limitations to this QI project were the PCPs' individual attitudes, beliefs, and perceived confidence level in dealing with victims of violence, potentially leading to lack of participation in the project, participation in the education session intervention but avoidance in the screening intervention, untruthful estimates of their own screening practices, or experimental mortality. Asking PCPs to add another screening to their already demanding schedule could have been met with resistance due to perceived lack of time. Particularly if PCPs were not comfortable with IPV screening or perceived a lack of resources or support if faced with a positive patient IPV screen, they may have avoided participation in this QI project.

Delimitations. This project took place in a PCF that gives considerable time and renumeration to its PCPs to gain additional knowledge and competencies through actively engaging in continued learning opportunities. As such, the culture of this PCF is forward thinking, research inclined, and innovative. The PCP population in this QI project may have had a greater commitment and acceptance to gaining the knowledge and using the EMR tools that are needed to provide IPV screening. Other clinical practice settings may not have the same level of provider buy-in, organizational interest, allotted time, or remunerative incentives for PCPs to be able to enhance their clinical knowledge and skill set.

Summary and Organization of the Remainder of the Project

IPV is often unrecognizable and found to be one of the most common forms of violence against women (WHO, 2013). Almost all health care professionals will encounter victims of violence during their health care career (C. Sims et al., 2011). Early identification of IPV through screening is an important step in improving women's health outcomes (Curry et al., 2018). Yet, rates of IPV screening completed in a family practice

setting have been found to be less than 2% and to vary significantly among health care professionals (Hamberger et al., 2015). Education and training for PCPs on IPV vary greatly despite being highlighted as instrumental in fostering PCPs' confidence in managing victims of violence (Sawyer et al., 2016). The verbal HITS IPV screening tool has been demonstrated to be a valid screening tool in the family practice setting for identifying IPV victims (Shakil et al., 2014). In addition, the use of health information technology, such as EMRs, can lead to increased injury and violence screening surveillance practices that can theoretically improve health outcomes (Haegerich et al., 2015). The use of a multimodal interventional approach that includes IPV education, EMR system supports, and use of an evidence-based IPV screening tool could effectively improve identification of IPV in women of childbearing age, thus supporting positive patient outcomes.

Chapter 2 presents a review of current research on the significance of IPV screening in the primary care setting for women of childbearing age. Evidence-based methods such as PCP IPV education, EMR system supports, and the use of an evidence-based IPV screening tool are further explored. Chapter 3 describes the methodology, design, and procedures for this QI project. Chapter 4 discussed how the data were analyzed using both a written and graphic summary of the results. Lastly, Chapter 5 provides an explanation and discussion of the findings as they relate to the existing body of research related to the QI project.

Chapter 2: Literature Review

Intimate partner violence is a global problem that has many health costs to its victims and the health care system (CDC, 2017; Sprague et al., 2016). One in three women have reported being victim to violence by an intimate partner. Although IPV can affect women of all ages, it is most prevalent in women of childbearing age and has been found to contribute to many serious physical and mental health ailments leading to poorer health outcomes (WHO, 2013). Screening is an important aspect of providing trauma-informed care as IPV is often unrecognizable and underreported due to lack of screening and non-disclosure from patients. Trauma-informed care is an increasingly common practice approach used in the health care setting as it creates empowerment and a sense of control built on an understanding of and responsiveness to trauma that includes the emotional, physical, and psychosocial safety of both the provider and the victim (Abuse, 2014). Screening for IPV is documented as Step 2, recognize, in the four basic principles of trauma-informed care, which also include realize, respond, and resist re-traumatization (Agency for Healthcare Research and Quality [AHRQ], 2016). To recognize violence, the USPSTF has recommended screening all women of childbearing age, ages 14 to 46, for IPV (Curry et al., 2018).

This literature review examines current and existing evidence-based research focusing on improving patient health outcomes through the identification of IPV through enhanced provider adherence to the USPSTF IPV screening recommendations for women of childbearing age. The purpose of this literature review is to identify an IPV screening tool and translate existing evidence-based research on the usefulness of IPV education and the use of EMR systems to improve IPV screening practices within the health care setting with the goal of identifying IPV. The RE-AIM (reach, effectiveness, adoption,

implementation, and maintenance) framework (Glasgow et al., 1999) is examined, as it was the theoretical framework that supported this QI project.

Primary prevention screening for IPV, including IPV screening tools, barriers to IPV screening, and patient benefits of IPV screening are further examined in this review, as is improving provider awareness through burden of disease, IPV education, and EMR. For these two main concepts (primary prevention screening for IPV and improving provider awareness) and each of their three related subthemes, the principal investigator has incorporated empirical articles and summarized the QI project's purpose, sample population, limitations, conclusions, and recommended future research and practice implications.

The following keywords were searched: *violence against women, screening for IPV, screening for intimate partner violence, intimate partner violence screening, intimate partner violence, domestic violence, assessing intimate partner violence, intimate partner violence risks, intimate partner violence prevention, intimate partner violence education, electronic health records, and patient outcomes.* Additional keywords included *electronic medical records, electronic health records, electronic medical record reminder systems, intimate partner violence screening, electronic medical record reminder systems, and provider awareness*. Databases and search engines such as CINAHL, PsycINFO, MEDLINE, Social Science Citation Index, Cochrane Library, EMBASE, SAGE Research Methods, the AHRQ, and Google Scholar were used in the search to find articles written between the years 2013 and 2019. Articles that were selected were English-language, women populated, and primarily from the U.S. as Canada had only two articles that were relevant. A total of 792 articles were originally

found between all recorded databases, of which 50 articles qualified for use in this literature review.

Background to the Problem

Studies continue to show low IPV screening rates, signifying low clinical practice implementation (AHRQ, 2015; Hamberger et al., 2015). Furthermore, in Canada, studies that look at IPV identification through screening in the health care settings are limited and outdated. In spite of the USPSTF's Grade B recommendations on screening for IPV in women of childbearing ages 14–46 (Curry et al., 2018), neither the Canadian Task Force on Preventive Health Care (2013) nor the WHO (2013) have endorsed its recommendations due to lack of available evidence. Screening for IPV has been well researched and discussed in the literature, although it is setting- and practitioner-specific, so generic IPV screening rates within the primary care setting are limited. Hamberger et al. (2015) found IPV screening rates completed by a physician or a nurse in family practice or emergency room settings in the U.S. were less than 2%. The most commonly researched settings in regard to IPV screening have been obstetrics/gynecological, emergency rooms, and family practice settings (Sprague et al., 2016). Alvarez et al. (2017), in a systematic review, found that IPV screening was recognized as being important, yet only selective screening was often used.

Improved health physical and mental health outcomes in women of childbearing age are directly linked to early identification through screening (Curry et al., 2018). Adherence and improved rates of screening require measures to address providers' reported barriers to IPV screening. Barriers start with the lack of consensus to screen for IPV amongst national regulatory bodies, the lack of a gold standard screening tool, the absence of IPV screening guidelines, and the lack of health care professional training and

education (Wood, 2016). Further barriers to screening for IPV include lack of time, desire for privacy, unease with the topic, fear of offending the patient, perceptions of who is at risk for IPV, and lack of empowerment to fix the problem (AHRQ, 2015). Addressing such barriers would further support patients with improved health outcomes, bolster provider confidence, and improve adherence to the USPSTF's IPV screening recommendations (Curry et al., 2018).

Theoretical Foundation

The RE-AIM framework (Glasgow et al., 1999) provided the theoretical foundation for this QI project (see Table 1). The RE-AIM was developed by Dr. Russ Glasgow 20 years ago with the purpose of translating research into practice and policy with particular attention to external validity (Gaglio, Shoup, & Glasgow, 2013). It is one of the most frequently used frameworks in implementation science and for grant applications, as it has been successful in both planning and evaluating interventions. This framework has been found to be an appropriate theoretical framework in IPV (Glasgow et al., 1999). The RE-AIM framework has been used in previous research initially to assist in evaluating health-related interventions and programs though balancing internal and external validity while supporting dissemination and generalization. Over time, the framework has evolved to be used in health-related planning, reviews, and policies. Evaluation using a theoretical framework supports the design and implementation of evidence-based quality programs (Gaglio et al., 2013).

Table 1

The RE-AIM Framework

Factor	Description	Use in the study
Reach	How do I reach those who need this intervention?	Gain the interest and commitment of the PCPs at the PCF who participated in the QI project.
Effectiveness	How do I know my intervention is working?	Ensure that the QI project addressed the need for IPV identification through improved IPV screening rates, the impact of the interventions, and positive outcomes while mitigating possible negative effects within the PCF.
Adoption	How do I develop organizational support to deliver my intervention?	Collaborate with the PCF leadership to ensure their support for this QI project and their help with its effective delivery.
Implementation	How do I ensure the intervention is delivered properly?	With the support of the PCF, the QI project was implemented with the intended population (PCPs screening women of childbearing age) and setting (PCF).
Maintenance	How do I deliver the intervention over the long term?	To be determined by the PCF leadership if they want to continue use of the applied multimodal intervention strategies beyond the QI project period.

Note. Adapted from "Evaluating the Public Health Impact of Health Promotion Interventions: The RE-AIM Framework," by R. E. Glasgow, T. M. Vogt, & S. M. Boles, 1999, *American Journal of Public Health*, *89*(9), p. 1324. Copyright 1999 by American Public Health Association.

RE-AIM has dimensions for individuals and within a contextual setting. The RE (reach and effectiveness) portion focuses on individuals such as PCPs or patients, and the AIM (adoption, implementation, and maintenance) portion focuses at the setting level such as the PCF (Glasgow et al., 2019; Glasgow et al., 1999). Although the RE-AIM

framework has been criticized, as it has been found to underreport in the dimensions of adoption and maintenance (Gaglio et al., 2013), it has also been found to be highly effective in reassessing interventions and programs after they have been deployed. Not all the dimensions of the RE-AIM framework need to be developed or utilized; users can prioritize based on their needs.

The RE-AIM framework (Glasgow et al., 1999) was chosen for this QI project as it supports IPV identification through the implementation of evidence-based IPV screening research into the clinical practice setting of a PCF. Evidence and key organizations recommend and support the use of IPV screening amongst their patients, primarily women of childbearing age, yet the adoption of such screening practices remains low among health care professionals. The implementation of an IPV education session, use of the HITS screening tool, and an EMR alert system have all been shown in the literature to improve providers' IPV screening practices (Onders et al., 2014; Shakil et al., 2014; Sprague et al., 2018). Use of the RE-AIM framework supported adoption of current IPV screening recommendations with the implementation of several multimodal evidence-based interventions, and, lastly, assisted in evaluating this QI project's impact amongst patients and the facility through identification of IPV.

Review of the Literature

The following review provides a synthesis of the literature and examines contributions that support the primary themes and subthemes of this QI project. The following themes and subthemes are discussed: (a) primary prevention screening for IPV, including IPV screening tools, barriers to IPV screening, and patient benefits of IPV screening; and (b) improving provider awareness, including burden of disease, IPV education, and EMR tools for support. The principal investigator chose these themes and

subthemes as they represented existing evidence-based research that could be translated into clinical practice to enhance providers' adherence to IPV screening. All themes and subthemes also support the QI project's variables that were used to implement the multimodal intervention to increase the rate at which women of childbearing age were screened for IPV within a PCF in Vancouver, BC, Canada.

Primary prevention screening for IPV. Screening for IPV within the U.S. health care setting is recommended by the Institute of Medicine, USPSTF, and many other leading national health care organizations (Miller et al., 2015). Rates of IPV screening vary widely amongst health care settings, although the USPSTF has continued to endorse IPV screening to all asymptomatic women of childbearing age in the latest 2018 guidelines (Curry et al., 2018). In a meta-analysis of six clinical trials, IPV screening doubled identification of IPV in women that were experiencing IPV (O'Doherty et al., 2015). The Canadian Task Force on Preventive Health Care (2013) was of the opinion that evidence did not justify endorsement of IPV screening in Canadians, thus screening practices amongst health care professionals in Canada are poor. However, due to the high prevalence of IPV globally and the devastating impact to victims' physical and mental health, leading to poorer health outcomes, PCPs should explore risk for IPV regardless of conflicting IPV screening guideline recommendations.

Several IPV screening tools for use in the clinical practice setting have been found to be highly sensitive, specific, and reliable for identifying IPV in women of childbearing age (Curry et al., 2018). Studies have not demonstrated increased or additional harm of further violence with screening despite health care providers reporting this factor as a barrier to adoption of IPV screening practices (Feltner et al., 2018; Wood, 2016). In fact, PCPs who screen and counsel for IPV can positively improve the health

and well-being of women and reduce further victimization (Clark, Renner, & Logeais, 2017).

IPV screening tools. Screening in the health care setting increases the identification of patients experiencing IPV (O'Doherty et al., 2015). The most critiqued IPV screening tools in the literature were Hurt Insult Threaten Scream (HITS); the Woman Abuse Screen Tool (WAST); Partner Violence Screen (PVS); and the Abuse Assessment Screen (AAS). Intimate partner violence screening tools' validity, reliability, and usefulness in the clinical setting remain highly debated (WHO, 2013). However, the literature evaluating the reliability, validity, and effectiveness of IPV screening tools is limited. In-person face-to-face IPV screening versus computer self-assessment screening has been reported to lead to better disclosure (Frazier & Yount, 2017). Disclosure of sensitive information between the patient and the screening PCP has been found to be dependent on the mode in which the screening is conducted (Frazier & Yount, 2017).

Messing and Thaller (2013) examined the predicted validity weighted by the sample size of five IPV risk assessment tools (Domestic Violence Screening Inventory, Ontario Domestic Assault Risk Assessment, Spousal Assault Risk Assessment, Danger Assessment, and Kingston Screening Instrument for Domestic Violence). These were used for IPV screening and were appraised in previous research studies using the Receiver Operating Characteristic Area Under the Curve (AUC). According to Messing and Thaller, The Ontario Domestic Assault Risk Assessment had the highest average weighted (AUC = .666, k = 5), with Kingston Screening Instrument for Domestic Violence having the lowest average weighted AUC (AUC = .537, k = 2). Limitations of their study were that valuable articles were excluded due to the strict inclusion criteria, yet several studies in which the risk assessment instruments were not applied correctly

were included. Research limitations could also be raised around overlapping confidence intervals to regulate AUC averages (Messing & Thaller, 2013). For future research recommendations, the authors suggested the use of different outcome measurements to assess validity.

Walton, Schbley, Muvuti, Milliner, and Zaaeed (2017) conducted a study to investigate the reliability and validity of a newly developed IPV screening tool for use in the physical therapy setting. Their primary focus was to create a screening tool that was therapist friendly, reliable, and valid, and that could be easily integrated into the current physical therapist assessments. Second, the newly created IPV screening tool needed to incorporate psychosocial elements of musculoskeletal pain a patient may experience. The IPV screening tool that was created and tested was based on a literature review and included 19 questions (17 Likert scale questions and two visual analog questions). Four experts evaluated the screening tool and reported the intraclass correlation coefficient for the entire survey rubric was 0.71 ($p < 0.0005$). In conclusion, the screening tool was found to be valid and reliable with strong internal consistency (0.79–1.0) and strong kappa scores that demonstrated good to excellent construct validity. Limitations discussed were possible survey review bias and two survey questions that were not fully agreed upon by all the reviewers. The authors suggested a further pilot within the original clinical setting to evaluate its usefulness and to gain more feedback from clinicians and patients to its usefulness (Walton et al., 2017).

Shakil et al. (2014) compared the original HITS IPV screening tool to a newly created simplified verbal response questionnaire through a secondary analysis of both tools. The verbal HITS tool was created to improve IPV screening due to reported barriers such as time constraints. Researchers changed the original, written, paper-and-

pen HITS questionnaire that evaluated IPV through a Likert scale to questions that could be answered verbally with a simple yes or no. The study was conducted in two phases. Phase 1 was the development of the verbal HITS questions based on the original paper-and-pen questionnaires. Phase 2 of the study evaluated the verbal and the original written forms of the HITS in a volunteer adult female family practice patient group that had completed both formats (Shakil et al., 2014).

When comparing the written and verbal HITS screening formats, Shakil et al. (2014) found a positive outcome. A one-way ANOVA test, used to analyze the differences among group means, revealed a statistical difference among the means, $F(4, 97) = 71.93$, $p < .0005$, and the difference was found to have a linear trend, $F(1, 97) = 271.56$, $p < .0005$. A strong linear relationship was found between the original written HITS and the new verbal HITS, $c = .84$. This meant that the difference between the written and verbal HITS demonstrated a 71% variance in total scores. Patients' responses to either the written or verbal HITS questions were found to be related. Shakil et al. did not report limitations to their study; however, the study sample was small ($N = 103$), with potential sample bias highlighted. Future research recommendations were to expand on the use of the verbal HITS tool in the male population and other high-risk populations for further validation (Shakil et al., 2014).

There is no current gold standard IPV screening tool for comparison measurement. Additional research is needed to evaluate the psychometric aspects of IPV screening tools and determine how to maximize sensitivity (Rabin, Jennings, Campbell, & Bair-Merritt, 2009). The USPSTF evaluated IPV screening tools and identified six that were the most sensitive and specific (Curry et al., 2018). Practitioners need to individually identify IPV screening tools that are relevant to their practice and population

(Curry et al., 2018). The HITS IPV screening tool (Shakil et al., 2014) was identified through this literature review to be highly regarded, appropriate for the primary care setting, and statistically sound for use in this QI project.

Barriers to IPV screening. PCPs play a significant role in screening for IPV as almost all will encounter victims of violence during their health care career (C. Sims et al., 2011). Yet, IPV screening rates in the primary care setting have been found to be low and an underdelivered service (Sharples, Nguyen, Singh, & Lin, 2018). The most common barriers to IPV screening cited amongst PCPs were lack of time, screeners' negative perceptions, lack of education, and lack of awareness of IPV screening tools (Wood, 2016). A better understanding of potential barriers to why PCPs may avoid IPV screening helped this QI project to be successful at mitigating such barriers.

Alvarez et al. (2017), in a systematic review, looked at influential factors when screening or counselling for IPV. A total of 35 articles were used in their review that examined screening practices, rates of screening, who is screening, how screening is performed, screening responses, influential factors on screening, and results of studies of interventions for providers designed to improve screening practices.

Alvarez et al. (2017) found that screening practices were often selective and only when an injury was apparent, even though the importance of generalized screening was acknowledged. In addition, routine screening rates amongst the articles reviewed were low, with 2–50% of providers reporting their screening rates to be always or almost always. The term *routine screening* was also found to have different meanings amongst providers, which affected when providers screened. Barriers to IPV screening by providers were found to be lack of privacy to conduct screening, lack of remuneration for IPV screening, time constraints, absence of protocols, and providers' attitudes, beliefs,

and perceptions of screening. Limitations of Alvarez et al.'s review were the complexity of the multiple factors the study examined, disregarding tools used to screen, special populations, and providers' responses to victims. Future research suggestions included further testing applicability of screening and responding to IPV in the health care setting.

Similar findings in previously dated literature about potential IPV screening barriers has been well documented. DeBoer, Kothari, Kothari, Koestner, and Rhos (2013), in an unidentified cross-sectional investigation, studied nurses who worked in a hospital trauma level 1 setting (N = 494) and their perceived barriers to IPV screening practices. Perceived barriers to screening included time constraints, inadequate training and education, lack of privacy to conduct screening, fear of offending the patient, and personal experiences with IPV. Limitations of DeBoer et al.'s study were the low response rate, a single site population sample, and evaluation of perceptions rather than factual evidence. Future research suggestions encouraged other trauma centers to evaluate their current IPV screening practices.

Alotaby, Alkandari, Alshamali, Kamel, and El-Shazly (2013) looked at barriers of IPV screening in the primary care setting by comparing nurses and doctors. Specifically, barriers related to culture, examiner, health administration, and the victim were studied. Physicians (81.9 ± 15.6; p = .112) were found to have the most barriers compared to nurses (77.5 ± 20.1; p = .112). The researchers' observational cross-sectional study in Kuwait was focused on revealing nurses and doctors' barriers to IPV screening of victims of violence in the primary care setting. Physicians reported insufficient training (82%; p = .005) and lack of staff (79.7%; p = .119) to be their highest barriers. Nurses compared to doctors were found to admit to being less influenced about the usefulness of IPV screening (76.1%; p = < .001) and lack of staff (72.3; p = .119) as their highest

barriers. Out of all four barriers that were studied, barriers that were related to the victims themselves ranked the highest for both physicians (92.9 ± 19.7%) and nurses (85.9 ± 17.6%; p = .02). Barriers related to examiners were the lowest for physicians (67.8 ± 26.9%) and highest for the nurses (69.9 ± 28.6%, p = .01; Alotaby et al., 2013). Limitations and future research suggestions were not discussed.

There have been many documented barriers to screening for IPV within the health care setting by PCPs. Yet, almost all health care professionals will encounter victims of violence during their health care career (C. Sims et al., 2011). Removal of such barriers could improve screening practices in the health care setting, leading to early identification of victims and referral to appropriate support and community resources. This literature review further supported the QI project's interventions of IPV education and use of EMR supports to help address commonly reported barriers such as lack of time, lack of education, and poor systems supports.

Patient benefits of IPV screening. IPV screening has been shown to be useful for victim identification. However, little is known about the outcomes of such screening practices such as referrals, repeated violence, and violence arising from IPV screening (O'Doherty, 2015). In a qualitative comparative analysis, Spangaro, Koziol-McLain, Rutherford, and Zwi (2019) studied the impact of 32 women's stories by mapping their IPV screening and the conditions that led to the outcomes of their screening. Patients were either mapped to have a positive outcome or no positive impact from the IPV screening through various set pathways. The study found that 16 weeks after initial antenatal screening of 32 women, 24 reported a positive impact to the screening, 6 reported no impact, and 2 reported negative impacts (Spangaro et al., 2019). Reported positive impacts besides IPV disclosure from the women included being asked about the

violence endured, support and validation given by the providers through naming the abuse, safety planning, and the delivery of care. Of note, all 32 women were asked if they agreed with being screened for IPV, and all women agreed that such IPV policies were useful (Spangaro et al., 2019). A limitation to their study was that the key conditions analyzed (care in asking, support, and validation) as common themes were chosen by the researchers, leaving others disregarded. Future research recommendations were to promote the use of qualitative research to ensure victims of violence voices are heard.

Screening for IPV in the literature has been found to benefit earlier identification of victims and improved health outcomes (Curry et al., 2018). O'Doherty et al. (2015), in a meta-analysis and systemic review, examined the effectiveness of screening for IPV within the health care setting as it pertained to identification of victims, referrals for support, improvement of a woman's well-being, and decreased future violence and harm. A total of 11 (N = 13,027) randomized and quasi-randomized trials were included in their review, in which six studies (n = 3,564) demonstrated improved identification of IPV through screening (risk ratio 2.33, 95% CI 1.39–3.89), mostly in the prenatal setting. Three (n = 1,400) of the studies did not find an increase in referrals for IPV support services (2.67, CI 0.99–7.20), and two of the studies that measured violence 3 to 18 months after screening reported no decrease in IPV (O'Doherty et al., 2015).

O'Doherty et al. (2015) also found in one study that harm was not caused from screening. Although they found that IPV screening is beneficial for improved IPV identification, identification rates reported were disproportionate to reported prevalence rates of IPV, suggesting that IPV screening may not be as sensitive. Future research looking at IPV screening tools utilized by PCPs and influences with practice settings is needed to better understand this finding.

The results of risk of harm due to IPV screening cannot be generalized, as only one of the studies included in this review looked at actual harm (O'Doherty, 2015). In addition, none of the studies reported improved health outcomes in the women screened. More research that specifically analyzes harms of screening and improved health outcomes is necessary to further support the benefits of screening for IPV within the health care setting.

Iverson et al. (2018) conducted a retrospective review from 11 different sites of 774 past medical records of women who screened positive for IPV and evaluated the adoption, penetration, and efficiency of secondary IPV screening that identifies risk for severe violence and its effects on follow-up services. The extended HITS IPV screen (Iverson et al., 2018) was used for initial IPV screening and the danger assessment was used in secondary IPV screening. The study evaluated health care settings that already had IPV screening practices deployed amongst their PCPs to see if a secondary screening measure using the danger assessment IPV screen in women who were identified as victims of violence received timely follow-up services. Iverson et al. found that out of the 11 facilities evaluated, only three (27.3%) were using secondary screening in their previously identified IPV victims. Health care sites that had newly adopted secondary IPV screening demonstrated that 56.4% of women who screened positive for IPV received secondary screening, and out of the 185 women who were secondary screened, 33% were found to be positive for severe IPV. Secondary screening that was found to be positive had a higher rate of psychosocial care within 60 days (73.8% vs. 54.0% of IPV+ patients screening negative; $p < .05$), lower posttraumatic stress disorder diagnosis (31.1% vs. 15.3%; $p < .05$), and fewer instances of being physically threatened or harmed (> 50% vs. < 15%; $p < .001$). Limitations to the Iverson et al. study were limited data in

the patients' electronic health records that led to the researchers being unable to address implications for low uptake and penetration of secondary IPV screening. Future research into providers' barriers to secondary screening and reasons for low penetration were suggested.

The literature supports the use of IPV screening as a primary prevention strategy that is useful in identifying victims of abuse. Screening can identify victims earlier who may not have otherwise been offered help and support. Long-term consequences of IPV that affect physical health, impair emotional well-being, and lead to problem behaviors can be addressed earlier through IPV identification (Simmons, Knight, & Menard, 2018). Screening for IPV can lead to earlier identification, effective safety interventions, and improved health outcomes for victims of violence (Rabin et al., 2009; Sprague et al., 2016). Potential benefits of IPV screening were a necessary component of the PCPs' IPV education intervention for this QI project.

Improving provider awareness. PCPs are in an excellent position to create and maintain trusting relationships to address IPV. Research has indicated that IPV awareness within the health care setting is lagging and much is needed to improve it (Leppäkoski, Flinck, & Paavilainen, 2014). Attention to improving providers' awareness of IPV starts with understanding the burden of disease, providing IPV education and local resources, and positioning supports through EMR systems. Through provider awareness, victims of violence can receive individualized and tailored intervention strategies that best address their needs (Macy, Martin, Nwabuzor Ogbonnaya, & Rizo, 2018).

Burden of disease. WHO (2013), for the first time, produced aggregate global and regional prevalence rate estimates on IPV against women collected from 155 studies in 81 countries through a systematic review, the collection of survey data, and the use of

meta-analysis. Population data was used given that other methods, such as practice-based and surveillance data on violence, have demonstrated significant underreporting (WHO, 2013). WHO prevalence percentage rates were calculated with a statistical demonstration to account for the variances in data quality from all the included studies used to calculate prevalence rates. The latest reported data collected from 2010 indicated that 35% of women worldwide had experienced either physical and sexual IPV or nonpartner sexual violence. Prevalence was highest in Africa, the eastern Mediterranean, and Southeast Asia. In addition, 30% (95% CI = 27.8%–32.2%) of women had incurred physical or sexual violence from an intimate partner. IPV prevalence was highest globally in women aged 40–48 (37.8%); the age range with the lowest prevalence rate was 55–59 (15.1%; WHO, 2013). Limitations of the WHO's (2013) review were the quality of data obtained to assess the impact to one's health resulting from IPV other than just partners; the inclusion of only a select amount of health outcomes affected by IPV, and therefore no identification of comorbidities were addressed; and the exclusion of psychological abuse in prevalence rates.

The importance of capturing IPV prevalence rates continues to be well reported and researched in the literature (Spivak et al., 2014; Widom et al., 2014). IPV prevalence rates are highest in women with underlying mental health conditions who have a history of childhood trauma (Spivak et al., 2014; Widom et al., 2014). Additional risk factors include poverty, homelessness, substance dependence, homosexuality, joblessness, and residing in a lower income neighborhood (Buller et al., 2014). Higgins, Manhire, and Marshall (2015) used routine IPV screening in a sizable general practice in New Zealand to obtain prevalence data. In a descriptive, retrospective study, they screened and evaluated individuals (N = 6,827) relative to their age, culture, sex, screening result, and

health center enrolment status. A positive IPV disclosure prevalence rate (11%) was discovered among individuals aged between 36 and 45 years, who disclosed the highest amounts of violence. However, this figure was substantially lower than a previous New Zealand study that reported a 78% prevalence rate (Higgins et al., 2015). Despite the lower than previously reported IPV exposure rates, IPV screening in this setting was found to be still useful (Higgins et al., 2015). Limitations of Higgins et al.'s study were sample and data collection methods that could result in biases. There was no discussion of recommendations for future research.

In 2014, 4% of self-reported spousal violence (physical and sexual) in Canada was from either an existing spouse, previous spouse, or common-law partner (Burczycka, 2016). That was a decrease in a previously reported 7% of self-reported spousal violence from a decade earlier. Both women (342,000) and men (418,000) from across each Canadian province reported (4% respectively) equal amounts of partner violence in 2014 (Burczycka, 2016). The most common reported types of physical violence were being shoved, grabbed, pushed, or slapped (35%), followed by sexual assault, beating, strangulation, and being threatened with a knife or gun (25%). Victims of partner sexual assault reported nonconsensual sexual activity (59%) in which they had been pressured, drugged, manipulated, or physically forced (Burczycka, 2016). Physical injuries sustained from partner abuse were seen more commonly in females (40%) than males (24%). Lastly, in Canadian provinces, victims of violence were found to suffer from posttraumatic stress disorder (16%) and avoid police involvement following abuse (70%); Aboriginal women were twice as likely to be abused than non-Aboriginal women in Canada (Burczycka, 2016).

PCPs need to be competent in identifying and responding to violence within their patient populations. The burden of disease from IPV impacts patients' physical and mental health, has great costs incurred by the health care system, and increases mortality and morbidly in patients both globally and nationally (WHO, 2013). The literature reviewed in this section identifies the relevance and unaddressed need for this QI project within a practice setting with no current IPV screening practices.

IPV education. To address IPV in the health care setting, organizations need to have onsite IPV trained staff, mandatory IPV education, policies and procedures, partnerships with IPV experts, community resources, QI strategies, and the incorporation of primary prevention practices (Hamberger et al., 2015). Sprague et al. (2018) found that five hours and less of IPV education was positively impactful to the learner. Lack of clinical training in IPV and how to conduct IPV screening have been identified in the literature as significant barriers that can easily be fixed through the incorporation of IPV training and education. Training PCPs on their roles and responsibilities on IPV identification, intervention, and prevention is a critical step (Khumisi, De Waal, & Van Wyk, 2015). Continued educational efforts are necessary to address the gap in IPV knowledge and training within the health care setting (Alshammari, McGarry, & Higginbottom, 2018). This section compares different PCPs and how they are trained to assess, detect, and screen for IPV.

Sprague et al. (2018), in a scoping review and integrated research process of 65 articles, looked at IPV educational programs for health care professionals in an aim to identify evidence-based educational program recommendations on IPV and spark future research needs. Descriptive statistics found that in the IPV educational programs that were offered, physicians were primarily the attendees (38.7%, $n = 24$) compared to

students, residents, and fellows (38.7%, *n* = 24), nurses (37.1%, *n* = 23), and social workers or counselors (17.7%, *n* = 11). The most frequent outcome from an education session was IPV knowledge (71.0%, *n* = 44), and educational interventions were mostly conducted by IPV educators (38.7%, *n* = 24) through interactive approaches (62.9%, *n* = 39 studies) without specific IPV treatment protocols (67.7%, *n* = 42; Sprague et al., 2018). The scoping review found that 34 (54.8%) of the studies reported a positive, effective program outcome especially with more than five sessions (71%) in which total hours of training were five or fewer (62%). None of the included studies reported negative outcomes from their educational interventions. The greatest positive outcomes were found in the delivery of IPV education programs that had an online training section (100%), were delivered by an IPV expert (75%), involved a treatment protocol (60%), and included resources for the patients (71%) and provider (66%). Limitations to their study were a potential publication bias and limiting the articles to English only. Sprague et al. (2018) concluded that future research was difficult due to heterogeneity.

Pagels et al. (2015) studied family medicine training in IPV screening by examining the knowledge, attitudes, and current practices regarding IPV of medical specialties (emergency, internal, family, obstetrics, and gynecology), physicians, and residents (*N* = 183). Associations between these factors and the medical specialties before and after controlling covariates were measured. Pagels et al. found that the majority (88%) of physicians reported feeling responsible for finding and treating IPV within their practice settings, and 97% reported that IPV education should be necessary in their medical school training. Limitations were that results were self-reported and from a single location site, and therefore may not represent accurate estimates. There was also a low response rate (33%). The researchers found positive attitudes amongst family

physicians associated with screening and treating IPV; however, medical education was found to positively impact and improve providers' confidence when screening and discussing IPV with their patient populations. Amongst the medical specialties studied, significant IPV knowledge differences were found in IPV occurrence rates, community resources, and screening tools (all $p < .05$). Recommendations from their study were used to create IPV training education for family medicine physicians and residents (Pagels et al., 2015).

Kamimura et al. (2015) investigated medical students' knowledge and training in IPV in the U.S., Vietnam, and China through a cross-national, cross-sectional study. A survey method was used to gather thoughts, education, and knowledge regarding IPV against women and the participants' experience with IPV victims. It was found that medical students' attitudes, experiences, and training regarding IPV varied greatly among the three countries, with the U.S. participants having the highest IPV experience ($n = 25$, 41.7%, 0.01 significance level) and insight into the significance of the issue. Although IPV is prevalent in all countries, medical students in Vietnam and China had little to no IPV education training (Kamimura et al., 2015). In conclusion, Kamimura et al. recommended strongly that IPV education needed to be integrated into Chinese and Vietnamese schools and throughout medical school education globally. Added value is seen when the student has actual interactions with IPV survivors. Limitations of their study were that causal relationships were not identified between the variables, there was possible selection bias, and the selected sample size was small (Kamimura et al., 2015). Their study was valuable in that it directly linked providers' IPV screening practices to IPV education and training.

The principal investigator evaluated techniques for IPV education in order to recommend the most effective methods to PCPs. To date, schools, health care organizations, and universities in Canada have not universally adopted IPV educational practices into their programs, and therefore, the workforce remains vastly uninformed (Burczycka, 2016). Education for PCPs is an essential strategy for improving IPV screening in the health care setting (Lee et al., 2019). There remains no standardized, evidence-based, gold standard for IPV education in the health care setting (Sawyer et al., 2016). This literature review has demonstrated evidence-based support for the implementation of IPV education to better support the implementation of this QI project.

EMR tools for support. The use of EMR clinical screening reminders and templates has been demonstrated to be valuable for improving prevention screening practices (Bae et al., 2018; Carey et al., 2015; Onders et al., 2014). Suresh et al. (2018) implemented a physical abuse clinical support decision tool into an electronic health record at a children's hospital through a randomized control trial. Physicians' compliance with clinical guidelines to evaluate physical abuse were measured through the use of a previously validated electronic health record alert used for child abuse. Following Suresh et al. (2018), compliance with clinical guidelines was measured through the study subjects being randomized into three groups. The first was a preintervention group, which was not provided with electronic alerts or access to order sets for physical abuse. The second group received an electronic alert with a direct link to an order set that was specific for physical abuse. The third group was not given alerts but could search for the order set independently.

Suresh et al. (2018) found that compliance with the clinical guidelines was 84% in the preintervention group, 86% in the randomized control group, and 89% in the

randomized control experimental group. It was also found that clinical guideline compliance was 100% when the EMR alert prompted the use of physical abuse order sets. Compliance also increased once the order sets were made available to other subject groups who did not originally have access to them (Suresh et al., 2018). The study's limitations were the pediatric population and the use of a small tertiary hospital that makes generalizability to the abuse population difficult. High baseline compliance, group contamination, and quick acceptance of the order set for physical abuse were also reported as limitations (Suresh et al., 2018). Future research suggestions of replication of this study in a hospital with lower baseline compliance would improve the reliability of the study's findings for evaluating additional populations such as children.

Siersma et al. (2015) evaluated the effectiveness of two different types of electronic reminders (ComRem or Postal) for increasing compliance with international normalized ratio point of care testing within 213 primary care practices in Denmark. The goal was to use electronic reminders to improve adherence of patients completing a health care task. Two groups were created for the 4-month randomized control trial in which the group was either sent a ComRem electronic reminder or a computer-generated Postal reminder if the monthly testing had not been completed. Siersma et al. found improved practice adherence in both groups; neither the ComRem electronic or the Poster reminder was shown to be more effective. Results indicated that both interventions were associated with adherence augmentation. Siersma et al. demonstrated that computerized reminder systems improved providers' adherence irrespective of capacity. A limitation to their study was that adherence efficiency to international normalized ratio point of care testing based on clinical guidelines was equal in the studied population demographic

area. Further, studies that evaluate the effectiveness of electronic reminders are suggested to better support the use of reminders within the health care setting (Siersma et al., 2015).

Lee et al. (2019) evaluated providers' readiness for IPV screening through increasing and standardizing IPV screening in women who presented for obstetrical or gynecologic outpatient care. The intervention consisted of integrating a validated IPV screening tool into the providers' EMR system, creating an automatic resource support telephone system, and offering provider education on how to screen and respond. Lee et al. reported an increase in significance for provider readiness ($p = .003$) with significant improvement in several domains that included "professional role resistance/fear of offending the patient" ($p < .0001$), "blame victim items" ($p = .0029$), "perceived self-efficacy" ($p = .0064$), and "victim/provider safety" ($p = .003$). Limitations to their study were that the sample size was small, and no control group was used to further evaluate the interventions. Lee et al. demonstrated that provider readiness to screen for IPV can be improved through the integration of a validated IPV screening tool embedded into the EMR with education for the providers. Further research in other practice environments and with other validated IPV screening tools would be valuable and help to further support the use of EMR alert systems.

Further research is needed that looks closely at the use of EMR systems to improve screening rates and identification of victims. To date, the literature has demonstrated strong evidence in using alert systems to improve screening practices for various health ailments. The use of health information technology such as EMR can lead to increased injury and violence screening surveillance practices that can theoretically improve health outcomes (Haegerich et al., 2015). It was identified through this literature

review that the use of electronic support systems could provide assistance to prompting screening for IPV and improve providers' screening rates.

Summary

IPV has been declared a public health problem with heavily weighted outcomes to its victims and the health care system (CDC, 2017). Victims of violence require public health attention and strategies to respond to violence accordingly, all while managing the significant health implications. Victims of violence encounter many physical and mental health consequences, which lead to the need for costly specialized medical services (CDC, 2017). The latest report indicates that approximately 1 in 4 women and 1 in 10 men will report IPV within their lifetime (Smith et al., 2015). Although outdated, the last documented societal cost of IPV exceeded $8.3 billion in 2003 (CDC, 2017).

Despite the literature demonstrating that earlier identification of victims of IPV improves health outcomes and decreases the cost to the health care system, IPV screening rates remain low and the practice is not widely adopted (Hamberger et al., 2015). Individuals with certain risk factors are more likely to become victim to IPV. Such risk factors may be found to contribute to IPV rather than be linked to a direct cause of IPV. Therefore, not all individuals found to have risk factors become victim to IPV (CDC, 2017; Slep, Foran, Heyman, & Snarr, 2015). Risk factors encompass societal, community, relational, and individual factors. Opportunities exist for improved health prevention and health promotion activities when the following risk factors are better understood and targeted (CDC, 2017):

- Mental health issues including depression, borderline personality traits, antisocial personality traits, and substance use disorders.

- Emotional instabilities including anger and hostility, low self-esteem, aggressive or delinquent behavior as a youth, insecurity and emotional dependence, and a need for control and power in relationships.
- Exposure to previous physical and psychological abuse, receiving poor parenting as a child, having experienced physical discipline as a child, and witnessing unhealthy family relationships and interactions.
- Social factors including unemployment, poverty, low income, and cultural and gender role differences.

Prior research has indicated several barriers to IPV screening, including uncertainty of appropriate IPV screening tools, lack of education and training, and provider discomfort with IPV (Bressler et al., 2016; Raissi et al., 2015; Wood, 2016). Implementing evidence-based interventions such as provider education, the use of a highly sensitive and specific IPV screening tool, and support within EMR systems is vital in improving health outcomes for women of childbearing age though improved IPV screening adherence.

Using the RE-AIM framework (Glasgow et al., 1999), this quantitative, nonrandomized, quasi-experimental QI project assessed the efficacy of a multimodal intervention to increase clinical practice compliance with the USPSTF's IPV screening practice recommendations for women of childbearing age (Curry et al., 2018) within a PCF in Vancouver, BC, Canada. This QI project implemented a PCP IPV educational session, an EMR IPV screening reminder alert, and an EMR IPV screening tool. The purpose of this QI project was to identify IPV and improve IPV screening rates for women of childbearing age amongst the participating PCPs at the PCF. At the time of this project, no consistent IPV screening practices existed. The following section, Chapter 3,

describes and explains the methodology, research design, and procedural guidelines in the QI project.

Chapter 3: Methodology

Intimate partner violence is a worldwide problem contributing to numerous health-related costs for both victims and the health care system (CDC, 2017; Sprague et al., 2016). Long-term health consequences associated with IPV include increased risk of physical, psychological, and reproductive ailments (CDC, 2017). IPV screening is recognized and strongly recommended as an initial and vital method in recognizing and responding to victims of violence (Curry et al., 2018; Sprague et al., 2016). Screening in the health care setting by PCPs has been found to increase the identification of patients experiencing IPV (O'Doherty et al., 2015). Screening is the first step in an IPV intervention process.

Despite evidence-based recommendations and global attention, many PCPs and health care organizations have yet to adopt, develop, and implement IPV screening practices into their clinical settings. PCPs play a significant role in identifying IPV through screening and improving health outcomes in this high-risk population as almost all will encounter victims of violence during their health care career (C. Sims et al., 2011). Screening for IPV can lead to earlier identification, effective safety interventions, and improved health outcomes for the identified victim (Rabin et al., 2009; Sprague et al., 2016). Without IPV screening practices and organizational policies, PCPs may overlook IPV as a global epidemic and fail victims who may not otherwise have disclosed the violence they are enduring. Only when IPV has been disclosed can patients' health outcomes start to improve.

The purpose of this quantitative, quasi-experimental QI project was to better identify IPV by improving IPV screening rates in women of childbearing ages 14–46 in a PCF through the implementation of a multimodal intervention. The intervention included

an onsite evidence-based IPV education session, an EMR IPV screening alert, and an evidence-based IPV screening tool, HITS (Shakil et al., 2014). This project aimed to translate existing evidence-based IPV screening knowledge and a validated IPV screening tool into a PCF to identify IPV and improve IPV screening practices for women of childbearing age (14–46). Chapter 3 includes a review of the QI project purpose, clinical questions, methodology, research design, target and sample populations, and proposed instrumentation. Lastly, the validity, reliability, data collection methods and analysis, ethical considerations, and limitations are discussed.

Statement of the Problem

IPV is a serious global epidemic with adverse outcomes in many populations, especially women (CDC, 2017). Victims of violence have significant health risks, poorer health outcomes, and increased risks of physical, psychological, and reproductive health ailments (CDC, 2017). Physical health risks of IPV include fibromyalgia, irritable bowel syndrome, chronic pain, sexually transmitted infections, and cardiovascular disease (CDC, 2017). The WHO (2013) has also reported that 42% of women who have endured IPV and sustained physical injuries had a 16% higher chance of having a low birth weight baby; spontaneous abortions were twice as common; and contraction of human immunodeficiency virus or syphilis was 1.5 times greater. Lastly, women who had experienced IPV were also found to be more likely to have alcohol misuse disorders (2.3 times) and were more likely to struggle with depression or anxiety (2.6 times; WHO, 2013). Psychological consequences of IPV include depression, anxiety, low self-esteem, posttraumatic stress disorder, and suicidal behaviors (CDC, 2017). The burden of such illnesses and health-related consequences to women who live in violence could be greatly reduced with interventions such as IPV screening and identification.

Screening women of childbearing age for IPV has been found to be effective in early identification, thus leading to moderately improved health outcomes (Curry et al., 2018). Almost all PCPs will encounter victims of violence during their career (C. Sims et al., 2011). As IPV can have unrecognizable signs and symptoms, all women of childbearing age should be screened. There are many risk factors for IPV that include individual, relationship, community, and societal risk factors (CDC, 2017). Despite the USPSTF's (2018) Grade B screening recommendations that women of childbearing age be screened for IPV regardless of signs or symptoms (Curry et al., 2018), the literature indicates such screening practices have not been widely adopted into the primary care practice setting. Reasons for poor IPV screening practices and the lack of adoption amongst PCPs have included a lack of providers' IPV knowledge and a need for added support, education, and training in IPV (Bressler et al., 2016; Raissi et al., 2015). Prior studies have demonstrated that enhancing a provider's IPV knowledge, use of EMR alerts, and IPV screening tools within an EMR improved screening practices (Haegerich et al., 2015; Sawyer et al., 2016).

Clinical Questions

The clinical questions that formed the basis of this quantitative, quasi-experimental QI project were as follows:

Q1: Does implementation of a PCP IPV educational session, an EMR reminder alert, and an EMR IPV screening tool increase IPV screening rates in women of childbearing ages 14–46?

Q2: Does IPV screening increase the rate of IPV identification in women of child bearing ages 14–46?

The clinical questions utilized existing evidence-based research and further explored its applicability within the primary investigator's clinical practice setting to identify IPV and improve clinical practice. Exploration of these clinical questions within the PCF quantified the efficacy of the multimodal intervention to identify IPV and increase clinical practice compliance with the 2018 USPSTF's IPV screening practice recommendations for women of childbearing age (Curry et al., 2018). The multimodal intervention (independent variables) consisted of the IPV educational session, the EMR IPV screening alert, and the verbal HITS screening tool. The onsite 45-minute educational IPV session was offered to consenting PCPs of the PCF to improve their awareness of IPV through a face-to-face lecture and slideshow presentation using the 2018 USPSTF IPV final evidence-based recommendation statements (see Appendix C). In addition, PCPs were trained on how to use the newly embedded EMR HITS IPV screening tool, what defines a positive IPV screen, available community resources, and how to access the PCF's onsite psychologist during the onsite educational session. Lastly, an IPV screening alert reminder was added to the current EMR system, alerting the PCP to screen for IPV if the patient was of childbearing age (14 to 46). The outcomes of interest (dependent variables) were the proportion of women of childbearing age who were screened and identified for IPV before and after the implementation of the multimodal intervention.

Data were collected for the outcomes of interest through a comprehensive EMR chart review during the baseline and follow-up phases (see Figure 1). The comprehensive EMR chart reviews gathered data to quantify with certainty the proportion of women of childbearing age who were screened for IPV and identified for IPV by the participating PCPs. The follow-up phase chart review used the EMR integrated HITS screening tool to

assess screening and IPV identification, whereas the baseline chart review relied on IPV screening and identification data recorded at the PCPs' discretion. This approach allowed the principal investigator to address the clinical questions through comparison of the participant PCPs' EMR charts before and after the multimodal interventions by measuring the PCP IPV screening rates and number of IPV identifications.

Quantitative methodologies are best utilized to explore clinical questions through representation of numerical data in which statistical analysis can be used to interpret results and determine significance (Zaccagnini & White, 2015). The use of a pretest–posttest design allowed quantifiable comparisons to be made based upon calculations of the degree of change before the multimodal intervention and afterwards. The clinical questions were based on current clinical practice issues within the PCF, and the QI project was designed to find evidence to answer the questions.

Project Methodology

This QI project used a nonrandomized quantitative methodology with a quasi-experimental, pretest–posttest design. Quantitative research methods are best suited for clinical questions such as the ones in this QI project as they can be used to explain phenomena through numerical data collection using mathematically based methods (Portela et al., 2015). Mathematical statistical analysis can then be applied to determine if a relationship exists between the variables (Zaccagnini & White, 2015). Furthermore, this design evaluated the impact of the evidence-based multimodal intervention without having a control group that did not receive the intervention or randomizing participants (Frey, 2018). A qualitative design approach would not have been appropriate as it was not the aim of this QI project to assess a phenomenon from the perceptions of those who

have experienced it, describe behaviors, or evaluate lived experiences (Zaccagnini & White, 2015).

This QI project set out to improve IPV screening rates and identify IPV amongst women of childbearing ages 14–46 in a small PCF with 33 PCPs. Therefore, this chosen design was ideal for exploring the principal investigator's clinical questions in this setting. Both descriptive and inferential statistics were conducted on data collected through a comprehensive EMR chart review. This analysis assessed whether the implementation of the evidence-based multimodal intervention resulted in a statistically significant increase in IPV screening and identification of female patients aged 14–46 who attended the PCF and sought health care from a participant PCP during the QI period.

Project Design

The selected design for this QI project was a nonrandomized quasi-experimental, uncontrolled pretest–posttest design. This design is commonly used in QI projects (Portela et al., 2015). The principal investigator determined that this design was best to assess the efficacy of the multimodal intervention at improving IPV screening rates at a single PCF and identifying IPV through a positive HITS screen. The QI project consisted of three phases: baseline, intervention, and follow-up (see Figure 1). During the baseline phase of the QI project, the principal investigator completed a comprehensive EMR chart review of the participating PCPs' EMR records to assess the number of patients who had been screened for IPV and the number of patients identified with IPV. These data quantified the baseline screening and IPV identification rates and were compared to post intervention IPV screening rates and the rates of positive HITS screens (indicating an IPV identification). Next, PCPs who consented to participate in the multimodal

intervention partook in an onsite IPV screening education session, including an EMR IPV screening alert (see Appendix D) and EMR integrated IPV screening template (see Appendix E). After the follow-up period of 30 days, the principal investigator reassessed the rate of IPV screening and the number of positive HITS screens in the participants' EMR records. This EMR chart review was used to quantify with certainty the proportion of women of childbearing age who were screened and identified positive for IPV amongst all participant PCPs using the HITS EMR integrated tool during the intervention period.

The outcomes of interest are the proportion of women of childbearing age screened and identified for IPV at a single PCF in Vancouver, BC. Preintervention IPV screening rates at the PCF were calculated during the baseline phase through a comprehensive EMR chart review. This method allowed the principal investigator to compare the screening rates before and after the intervention, while simultaneously assessing the identification of IPV through a positive HITS score in patients who were screened for IPV. As the PCF did not have a screening protocol at the time of the QI project, the primary investigator anticipated that baseline IPV screening and identification would be documented in narrative charting.

The multimodal intervention was administered to all participating PCP staff at the PCF and consisted of the implementation of an onsite IPV screening education session for PCPs, an EMR IPV screening alert, and deployment of an EMR integrated IPV screening tool. The IPV onsite educational session was a 45-minute presentation at the PCF to PCPs through an evidence-based IPV education session using the USPSTF's (Curry et al., 2018) final recommendation statements (see Appendix C). Following the lunch time IPV education intervention, participating PCPs resumed their regular work

duties. The IPV screening alert reminder was added to the current EMR system and alerted the PCPs to screen for IPV if the patient was of childbearing age (ages 14 to 46). PCPs were then able to initiate the verbal HITS IPV screening tool that had been embedded in the EMR. This multimodal intervention was selected as prior research has indicated that both IPV education and the use of EMR support tools could improve providers' IPV screening rates and identify IPV (Carey et al., 2015; Wood, 2016).

Population and Sample Selection

There were two target populations for this QI project which included PCPs and female patients of the PCF. Primary care providers included registered nurses, nurse practitioners, and family physicians, who were employed full-time, part-time, casually, or on a locum basis within the PCF in downtown Vancouver, BC, Canada. At the time of the QI project, the PCF employed 23 family physicians, four nurse practitioners, and six registered nurses, all of whom provided primary health care services, including medical care to women of childbearing ages 14–46. The potential sample selection included up to 17 family physicians, three nurse practitioners, and seven registered nurses employed at the PCF. This sample of PCPs was licensed and trained in BC to deliver health care services to patients for medical reasons (Peckham et al., 2018). The chosen sample PCPs provide daily direct medical care to patients, which may include medical diagnosis, nursing diagnosis, and referral to outside resources. Inclusion criteria consisted of PCPs who identified as a BC-licensed family physician, nurse practitioner, or registered nurse, and who were employed within the PCF during the time of the QI project. All PCPs who met the above inclusion criteria were solicited for this QI project. The exclusion criterion was PCPs who did not provide medical care to women of childbearing ages 14–46 at the PCF.

The second target population for this QI project was female patients between the ages of 14–46 who sought medical or nursing care from a participant PCP during the QI project period. Inclusion criteria consisted of being a female within the ages 14–46, being a patient of the PCF, and having sought medical or nursing care during the QI project period from a consented, participant PCP. Exclusion criteria included being younger than 14 or older than 46, of male gender, not a patient of the PCF, and not seen by a consented, PCP participant of the QI project.

This QI project occurred in a private PCF that is located in downtown Vancouver, BC, Canada. The principal investigator provided a detailed description of the QI project through a work email invitation, and participants were given an informed consent to voluntarily sign up and complete before participating. The informed consent described the purpose and intent of the QI project, as well as participants' rights such as confidentiality and option to withdraw. The power to detect an increase in the IPV screening rate and IPV identification in the EMR charts of participating PCPs depended on the baseline screening rate, the IPV identification rate, and the anticipated increase in those two rates (see Figure 2).

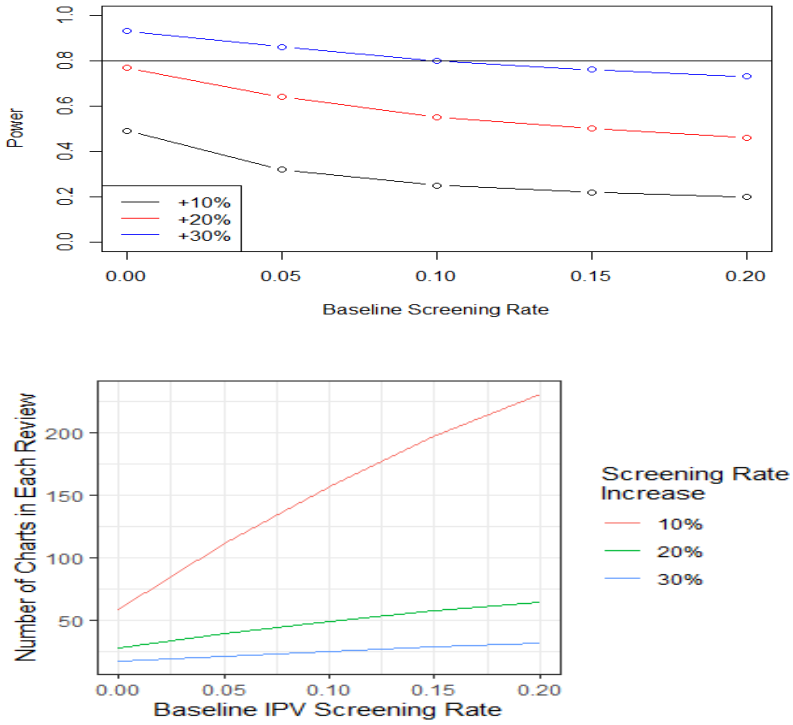

Figure 2. Summary of the sample size required to achieve 80% power, depending on the baseline screening and observed increase in screening rate, assuming one-sided testing.

Figure 2 indicates that if the baseline screening rate was close to 0, 80% power to detect an increase of screening by 20% would require a sample size of 27 charts in each comprehensive review. At baseline, each PCP attended 1 woman of childbearing age per day on average. The principal investigator calculated that by reviewing charts from a two-day window for each of baseline and follow-up, a recruitment of 20 PCPs would yield the desired sample size. If the baseline screening rates (30 days preintervention) were greater than 0% or the observed increase in screening rates was lower than 20%, the power of this study would be reduced. As well, it is worth noting that by assuming the baseline screening rates were 0%, the sample size calculations are not reliable as the expected counts are less than 5. Consequently, the sample size of 27 charts per review was considered a conservative estimate; thus, the principal investigator reviewed more

than 27 charts during each chart review. Each chart review consisted of all women of childbearing age seen by a participating PCP during a one-week window (5 business days). In this case, if 20 PCPs each saw 1 patient who met the chart review criteria, the principal investigator would review approximately 100 charts at baseline and 100 charts during follow-up.

Data collected from the comprehensive chart reviews were kept private, confidential, and anonymous through the creation of unique identifier codes for project participants and remained locked up onsite at the PCF. Data collected through the EMR were recorded through a password-protected spreadsheet. Unique identifier codes were given to each PCP when denoting which patients received care from which PCP. Onsite computers used for this QI project were password protected with encrypted hard drives.

Sources of Data

Screening and identification rates of IPV were the main data collected to address the clinical questions. Data were collected through a comprehensive EMR chart review to measure current IPV screening and identification rates; and as a posttest to determine changes in IPV screening rates and IPV identification following specific IPV training, implementation of an EMR IPV screening alert (see Appendix D), and an EMR embedded IPV screening tool (see Appendix E).

In this project, a comprehensive EMR chart review allowed the clinical questions to be addressed specifically while minimally burdening participating PCPs. In this QI project, the principal investigator conducted an EMR chart review to consented participant staff who included registered nurses, nurse practitioners, and family physicians (a) before the IPV educational session, EMR IPV screening alert, and HITS IPV screening tool were implemented, and (b) 30 days following this multimodal

intervention. This process allowed the impact of the intervention on IPV screening and IPV identification rates to be quantified.

During the 30-day baseline phase, IPV screening and identification rates were quantified during the EMR review using narrative EMR PCP notes. At the time of the QI project, no dedicated places existed in the EMR to record IPV screening or identification. The principal investigator reviewed the EMR charts of all participating PCPs for any narrative mention of IPV screening or identification in women of childbearing age to assess the baseline screening and identification rates.

In contrast, during the 30-day follow-up EMR review, the principal investigator was assessing IPV screening and identification on the basis of the EMR integrated verbal HITS screening tool. The verbal HITS IPV screening tool is a validated tool used to screen for IPV (Shakil et al., 2014). This tool was part of the multimodal intervention, as adding it to the EMR would facilitate PCP screening of women of childbearing age for IPV. In the 30-day period following the introduction of the multimodal intervention, the EMR charts of women of childbearing age were reviewed for completion and total score of the HITS IPV screening tool. This step allowed precise quantification, post intervention, of the proportion of women who were screened and identified for IPV. All QI participants' EMRs from women of childbearing age who visited the PCF during the intervention were reviewed, and the screening rate was calculated as the number of eligible patients with a completed HITS IPV screening tool over the total number of eligible patients. The rate of IPV identification was calculated as the number of eligible patients with HITS positive screens divided by the number of eligible patients.

Validity

The construct validity of a tool describes whether the tool is measuring what it is intended to measure (Taherdoost, 2016). Internal validity assesses whether inferences from the tool are accurate within the project population. External validity helps to determine the generalizability of a tool's results within a different context (Taherdoost, 2016).

The HITS screening tool used in this QI project was verbal; the HITS questions are asked in an interview rather than in a written format. The performance of the written HITS screening tool has been assessed by comparing female office employees to female self-identified victims of domestic violence (Sherin, Sinacore, Li, Zitter, & Shakil, 1998). By using the 4-item HITS tool, 91% of office employees and 96% of domestic violence victims were correctly identified, illustrating excellent discriminative ability. When the HITS tool was compared against the reputable 80-item Conflict Tactics Scale (CTS), the HITS tool showed concurrent validity (Sherin et al., 1998). In a subsequent validation study, the verbal HITS tool was shown to agree with the written HITS tool for 83% of respondents (Shakil, 2014). This indicates that the verbal HITS screening tool provides similar results to the written HITS tool and is a valid measure.

Reliability

Reliability refers to the consistency or repeatability of the results of an instrument. For this QI project, reliability entailed whether the HITS EMR tool provided consistent results when screening for IPV. The HITS tool has been shown to have a Cronbach's alpha of 0.8, indicating good internal consistency when applied to a group of female office workers (Sherin et al., 1998). This indicates the HITS tool has good internal consistency and is a reliable tool for assessing IPV in women.

Data Collection Procedures

The clinical questions were addressed through data collection procedures in the baseline, intervention, and follow-up phases of the project (see Figure 1). First, all PCPs who identified as physicians, nurse practitioners, and registered nurses at the PCF in Vancouver, BC, were invited through email and email calendar invite on September 17, 2019, to participate in the IPV educational lunch time session on September 23, 2019. The IPV education session opened with informed consent being reviewed, discussed, and signed before PCP engaged in the 45-minute IPV educational session. No personal information about the QI project's PCP participants or patients was ever obtained. All private information about them was removed, and PCPs were identified using only a secret identifier. This design ensured anonymity, privacy, and confidentiality. All signed informed consents were retained, protected, and locked up by the principal investigator at the PCF and will be retained for three years. After informed consent was obtained, the QI project multimodal intervention was implemented, which included the IPV education session, an EMR IPV screening alert, and the implementation of the HITS IPV screening tool into the current PCF EMR system. Randomization and groups were not used for this QI project as all participants received the same multimodal intervention.

The on-site 45-minute educational IPV session was offered to consenting PCPs to improve their awareness of IPV using the 2018 USPSTF's IPV final evidence-based recommendation statements (Curry et al., 2018). A slideshow was created with each of these sections, highlighting key points. PCP participants were also given an opportunity to engage in role-playing activities with one another. They practiced how to verbally introduce IPV screening during an in-person office visit. An example used was, "October is domestic violence month. Here at our clinic, we are screening women for intimate

partner violence. Do you mind me asking you a few questions?" In addition, the PCP participants were educated on the newly implemented scripted EMR IPV screening alert and how to use the integrated HITS IPV screening tool. The evidence-based HITS IPV screening tool was introduced and its usability was demonstrated within the PCF integrated practice management software, the Profile EMR system (Intrahealth Canada Limited, n.d.). Lastly, they were educated about onsite clinical supports, such as the full-time PCF psychologist and community supports for women who were found to have a positive HITS screen.

During the IPV educational session, the EMR IPV screening alert reminder and screening template were demonstrated. The IPV screening alert reminder appeared in red in the top right corner on the EMR computer screen (see Appendix D) when a participant PCP opened an EMR record of a woman of childbearing age (14–46). The following message prompt was used as the screening alert reminder for the PCPs: "IPV: Screen for IPV use ipv\" in all women aged 14–46 who presented for a medical visit with a PCP at the PCF during the QI project time frame. Participant PCPs then had the option of opening and attaching the newly embedded HITS IPV verbal screening questions (Shakil et al., 2014) within an EMR encounter note for the woman using the keystrokes "ipv\." The HITS tool has four questions that are answered with a yes or no verbal response (Shakil et al., 2014; Sherin et al., 1998). The IPV screening template indicated what constituted a positive IPV screen (1 yes answer = positive for IPV) and reminded the PCP to refer the patient to the PCF psychologist and/or community supports (see Appendix E). The IPV screening EMR alert and HITS IPV screening tool were activated the following day within the already existing PCF EMR system by the information technology team.

This QI project enrolled 16 PCP participants who volunteered and were unpaid for their lunchtime participation. Participants returned to their normal work duties at the PCF after the IPV education session having gained IPV knowledge, awareness of the IPV EMR alert, and the ability to access the HITS screening tool and resources for any encounter with a female patient aged 14–46. Any PCP participant who withdrew from the QI project would have been reported as withdrawn, and data that had been obtained from the participant would have been deleted from the final data analysis. However, there was no attrition, so no data were omitted. Validity was controlled by matching the QI project PCP participants to the patient EMR charts of women of childbearing age, 14–46, who were seen during the duration of the QI project.

A comprehensive EMR chart review of all 16 PCPs' EMR charts for women aged 14–46 within the 30-day preintervention period was completed, looking for narrative documentation of IPV screening and identification. In the 30 days leading up to the multimodal intervention, 244 women ages 14–46 had been seen by the voluntary PCP participants, of which none were screened for IPV and none were identified as positive for IPV. Another comprehensive EMR chart review was conducted using the 30-day period postintervention to assess which records did or did not contain documentation of IPV screening and identification using the HITS in women of childbearing ages 14–46. Data extraction was conducted through two comprehensive EMR chart reviews of the charts of all participating PCPs. The primary investigator served as the data extractor for this QI project during unpaid time. No monies were collected for such procedures.

At baseline, the principal investigator counted the number of visits of all women of childbearing age, all who were screened for IPV, and the number who were identified as having IPV. During the follow-up review, the principal investigator collected the same

counts, this time using the completion of the HITS screen found in the EMR to assess the number screened and using the number of positive HITS screens to assess IPV identifications, during the 30-day period. Results were collected within a password-protected spreadsheet, which was transferred into R which is a language and software environment for statistical computing and graphics (The R Foundation, n.d.-a; n.d.-b).

Upon completion of this QI project, all R data and raw data will be deleted and destroyed once they have been shared and the QI project has been assessed by Grand Canyon University. Data extracted were stored onsite at the PCF in a password-protected file on an encrypted, locked down desktop computer that additionally required the principal investigator's password to gain access. No field-testing instruments were required for this QI project. Upon completion of this QI project, all data will be deleted from the computer's hard drive. However, the principal investigator will retain the data in the QI project manuscript that will be necessary for scholarly submission and graduation from Grand Canyon University. Any identified source of error or potential impacts on data were reported.

Data Analysis Procedures

The purpose of the data analysis was to assess the impact of the multimodal intervention (onsite 45-minute IPV education session for PCPs, an EMR IPV screening alert, and implementation of the HITS IPV screening tool into the EMR system) on PCPs' IPV screening rates and IPV identification amongst women of childbearing ages 14–46. Descriptive statistics were used summarize the screening rates in the follow-up period. The screening proportions and identification rates as measured using the EMR were aggregated for before intervention and after intervention.

As this was a small QI project at a single PCF, the analysis conducted focused on quantifying the impact of the intervention. In particular, the principal investigator compared the pretest and posttest screening and IPV identification proportions using a *z*-test. A one tailed *z*-test or proportions was used due to the large sample size, the known population, as it determines if the means of pretest–posttest datasets are different from each other when variance is given. This statistical test was chosen and used in order to compare the proportion of women of childbearing ages 14–46 who were screened and found positive for IPV during the pretest and posttest periods. For the *z*-test, a *p*-value was reported, as *p*-values help to quantify statistical significance. A *p*-value can be between 0 and 1, where values close to 0 signify the probability the observed difference is not likely due to chance, whereas a *p*-value closer to 1 signifies that the observed difference is likely due to chance (Wilson, 2019). Typically, statistical significance is assigned when *p*-values are greater than .05. However, one must keep in mind that *p*-values do not determine that a difference observed is clinically significant. As such, *p*-values, as well as means and confidence intervals, have been reported for the pretest and posttest intervention screening rates as these are highly interpretable (Sylvia & Terhaar, 2018). Additionally, the pretest–posttest identification proportions were also compared using a *z*-test. Data analysis was conducted using R language and environment for statistical computing version 3.6.1 (The R Foundation, n.d.-a; n.d.-b).

Ethical Considerations

When assessing ethical considerations for this QI project, the key principles of *The Belmont Report* (Miracle, 2016), which include respect, justice, and beneficence, were used to ensure no harm was caused to participants or patients. In addition, trust, honoring fairness and respect for participants was adhered to at all times (Miracle, 2016).

Before commencement of this project, the PCF medical director approved and signed an affiliation agreement with Grand Canyon University, granting consent to operationalize this project at the PCF. Furthermore, the Institutional Review Board granted approval prior to the QI project being implemented (see Appendix F).

Informed consent was obtained from all PCPs participating in the multimodal intervention; patient participants were enrolled on the basis of their attendance at the PCF. In order to avoid project coercion, all potential PCP participants were asked for volunteer participation. All patients who were women of childbearing age, 14–46, who attended the PCF during the intervention period could have been screened for IPV using the EMR system. Screening for IPV was offered to all women of childbearing age during the QI project time frame. This practice was in line with the USPSTF's recommended standard of care (Curry et al., 2018). Women could opt out of answering the HITS screening questions and being referred for additional supportive resources with a positive HITS score. No other demographic details besides the patient's age were collected from this screening as no additional information was needed for the purpose of this QI project. Data collected from the PCPs remained anonymous and confidential and will be shared with the participant group once the QI project has been completed and approved by Grand Canyon University. Additionally, PCPs were informed that their participation in this project would not impact their employment status at the PCF.

The principal investigator did not anticipate any potential harms to the QI project participants or patients. No harm has been identified for the PCPs who participated in the multimodal intervention. No harm was anticipated for women of childbearing age who were exposed to the EMR HITS IPV screening tool (Shakil et al., 2014; Sherin et al., 1998), and none was found. Women of childbearing age enduring IPV may be deemed a

vulnerable population; however, the principal investigator exhausted the literature and found that the balance of benefits and harms with IPV screening could not be determined (Curry et al., 2018). Women screened and identified with IPV who would not have otherwise been identified were offered referrals to appropriate psychological or community supports, but they had the option to refuse such referrals.

To avoid a potential conflict of interest and project bias, the principal investigator did not conduct a chart review on her own patients' personal charts for this QI project. Permission to access patient records was granted via the PCF medical director and vice president; this QI project did not require the use of patients' personally identifying information or participation beyond the standard of care. Instead, this QI project aligned the PCF with the IPV screening guidelines that are set out by the USPSTF (Curry et al., 2018). All data collected were kept private, confidential, and anonymous. The data were stored securely onsite and will be destroyed after full completion of this QI project.

Limitations

Potential limitations to this QI project included bias, sample size limitations, and time constraints for both the duration of the project and for participants within the QI project. The PCPs' individual attitudes, beliefs, and confidence levels in dealing with victims of violence may have led to participation bias, where individuals with lower confidence or certain attitudes may have failed to participate fully in the multimodal intervention. To limit these forms of bias, the principal investigator ensured that the anonymity of participants was maintained throughout the QI project and that participants were aware that their participation would not impact their employment at the PCF.

This project has limited generalizability due to the small sample size and scope, which was accounted for in the data analysis plan. As this was a QI project that set out to

improve clinical practice compliance with the USPSTF's IPV screening practice recommendations for women of childbearing age (Curry et al., 2018) and identify IPV within a PCF, a smaller sample size was justified. Furthermore, the principal investigator did not expect to make strong conclusions generalizable to all PCFs. The intention was to examine the benefit of this multimodal intervention, generate new hypotheses for further research, and provide a service for patients within the practice.

Due to the short follow-up time period, it was difficult to assess whether any changes in the rate of screening for IPV are permanent. Furthermore, due to time constraints and the limited scope of this QI project, the individual components of the multimodal intervention were not addressed individually to quantify which intervention had the biggest impact on IPV screening rates. This was a known limitation given the limited scope of this project and established time frames; therefore, the application of the QI project's results will warrant further research.

Summary

Primary care providers in the health care setting play an important role in the early identification of IPV victims through robust IPV screening practices. IPV screening has been shown to be useful for victim identification and in improving health outcomes in this at-risk population (Curry et al., 2018; O'Doherty et al., 2015). Yet, the literature has indicated poor adoption of IPV screening practices amongst providers in the primary care setting (Hamberger et al., 2015). Provider IPV education, use of EMR alerts, and use of embedded templates have been shown to improve IPV screening amongst PCPs (Carey et al., 2015; Wood, 2016). Use of these evidence-based interventions could improve IPV screening practices and ultimately IPV identification within a health care setting.

A nonrandomized quantitative methodology, with quasi-experimental, uncontrolled pretest–posttest design, was used in the principal investigator's QI project to evaluate the impact of the multimodal intervention on IPV identification and the rate at which women of childbearing age are screened for IPV. The QI project consisted of three phases: baseline, intervention, and follow-up. During the 30-day baseline phase, participants' charts quantifying previous IPV screening practices and IPV identification were comprehensively reviewed and evaluated. The intervention phase encompassed implementation of the multimodal intervention that included IPV education (see Appendix C), an EMR IPV screening alert (see Appendix D), and the HITS IPV screening tool embedded into the EMR system (see Appendix E). During the 30-day follow-up phase, QI project participants' EMR charts were reevaluated to quantify the number of IPV screens that were conducted and positive HITS screens. The principal investigator conducted a comprehensive EMR chart review to quantify with certainty the proportion of women of childbearing age who were screened and identified for IPV using the EMR integrated tool.

The principal investigator compared the pretest and posttest EMR recorded screening and IPV identification proportions using a *z*-test. It was predicted that this QI project would show a statistically significant positive relationship between the multimodal intervention and the PCPs' IPV screening rates and IPV identification. Chapter 4 includes a detailed and methodical discussion of this QI project's findings.

Chapter 4: Data Analysis and Results

Intimate partner violence is a serious health concern. However, IPV screening is rarely performed in Canada (Burczycka, 2016). Previous studies have demonstrated that IPV education, use of an EMR alert prompt, and EMR integrated screening tools in the health care setting can help to identify IPV by improving PCP screening practices (Haegerich et al., 2015; Sawyer et al., 2016). The USPSTF endorses that women aged 14–46 are to be screened for IPV irrespective of risk factors, signs, or symptoms of abuse (Curry et al., 2018). Despite the USPSTF's (2018) Grade B evidence that women of childbearing age be screened for IPV, the literature indicates that IPV screening practices have not been widely adopted by primary health care facilities in Canada (Burczycka, 2016; Curry et al., 2018; Hamberger et al., 2015). It is therefore important to understand how IPV screening practices might be improved in Canada. Prior to this quality QI project, it was not known if the implementation of a multimodal intervention would improve screening and identification of IPV in women of childbearing ages 14–46 within a primary care facility (PCF) in Vancouver, British Columbia (BC), Canada. The intervention included an onsite PCP IPV educational session, an EMR IPV screening reminder alert, and Shakil et al.'s (2014) evidence-based verbal IPV screening tool, HITS.

Two clinical questions guided the QI project, as follows:

Q1: Does implementation of a PCP IPV educational session, an EMR reminder alert, and an EMR IPV screening tool increase IPV screening rates in women of childbearing ages 14–46?

Q2: Does IPV screening increase the rate of IPV identification in women of childbearing ages 14–46?

This was a QI project to improve the rate of IPV screening and detection at a PCF in Vancouver, BC. A nonrandomized, quasi-experimental, uncontrolled pretest–posttest design was used. It was performed by applying a multimodal IPV screening intervention for PCPs at the facility. This intervention consisted of three components: an onsite IPV education session, an EMR alert, and an evidence-based screening protocol, the HITS screening tool. The efficacy of the QI project was determined by observing if there was any change in IPV screening and detection rates before and after the intervention.

A one tailed *z*-test of proportions was used to compare the proportion of women of childbearing ages 14–46 who were screened and found positive for IPV during the pretest and posttest. A *p*-value ($p < .05$) was reported once data analysis was completed, as *p*-values help to quantify statistical significance among the nominal and categorical data (Wilson, 2019). A one-tailed *z*-test was used as the number of tails denotes the change that is expected to be observed; in this case, in one direction (Park, 2015). The principal investigator assumed there would be an increase in IPV screening and identification with the implementation of a PCP IPV educational session, an EMR reminder alert, and an EMR IPV screening tool. This chapter presents a detailed and systematic account of data collected, data analysis, and interpretation of results, as well as a summary of this QI project's findings.

Descriptive Data

The two target populations selected for this QI project were PCPs at the PCF and the women of childbearing age (14–46) who received care at the PCF in the 30-day periods leading up to and following the intervention. The population of PCPs included registered nurses, nurse practitioners, and family physicians who were employed full-time, part-time, casual, or on a locum basis within the PCF in downtown Vancouver, BC,

Canada. The PCPs who were eligible for this QI project provided daily direct medical or nursing care to women of childbearing ages 14–46, which may have included medical diagnosis, nursing diagnosis, or referrals to outside resources. These PCPs were licensed in BC to deliver health care services to patients for medical and nursing reasons. Inclusion criteria consisted of PCPs who identified as a BC-licensed family physician, nurse practitioner, or registered nurse; were employed within the PCF during the time of the QI project; were over the age of 18; and were willing and able to participate in the intervention. The exclusion criterion was PCPs who did not provide medical care to women of childbearing ages 14–46 at the PCF.

Of the 27 PCPs employed at the PCF, a total of 16 met the inclusion criteria for this QI project, and all 16 consented to participate in the project (see Figure 3).

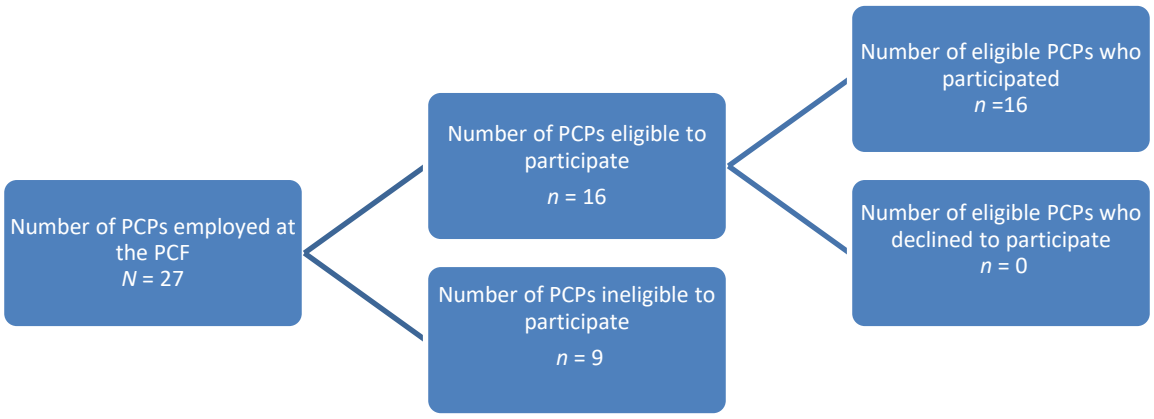

Figure 3. Number of PCPs employed at the PCF who participated in the project.

Table 2 summarizes the demographics of the 16 PCPs who consented to participate, including their age, role, and employment status. All participants identified as female.

Table 2

Demographics of Participating Primary Care Providers

Position	*n*	Age		Work status		
		M	*SD*	Full-time	Part-time	Casual
General practitioner	9	42	4.2	33%	56%	11%
Registered nurse	5	39	15.4	80%	0%	20%
Nurse practitioner	2	44	2.8	100%	0%	0%

Note. $N = 16$. All participants were female.

The second target population for this QI project was female patients between the ages of 14–46 who sought medical or nursing care from a participant PCP during the QI project period. Inclusion criteria consisted of being a female within the ages 14–46, being a patient of the PCF, and having sought medical or nursing care during the QI project period from a consented, participant PCP. Exclusion criteria included being younger than 14 or older than 46, of male gender, not a patient of the PCF, and not seen by a consented, PCP participant of the QI project. This sample population was necessary in order to evaluate the effectiveness of the multimodal intervention based on the USPSTF (2018) age and gender recommendations for IPV screening. The principal investigator reviewed patient records to ensure patients met the inclusion criteria when screening rates and IPV identification data were collected. This selected patient population had no demographic details or identifiable information recorded to protect the women's privacy.

The PCP sample population was invited to participate in this QI project on a voluntary basis through an email invitation to their work email address upon receipt of institutional research board (IRB) approval on September 16, 2019 (see Appendix F). Informed consent was provided to each QI participant that explained the QI project's purpose and intent, and participant eligibility, confidentiality, risks, benefits, and withdrawal privileges, before the multimodal intervention was implemented. All 16 PCPs who met the inclusion criteria consented to and participated in the project, as depicted in Figure 3.

From the women of childbearing age population, data on screening and IPV identification were collected from the EMR. A preintervention comprehensive EMR chart review assessed whether IPV screening and identification had been documented for patients meeting the inclusion criteria who received care from any of the 16 participant PCPs in the 30-day period preceding the multimodal intervention. Postintervention data were collected for the 30 days following the multimodal intervention.

To summarize the results and assess statistical significance, the R program was used (version 3.6.1; The R Foundation, n.d.-a; n.d.-b). Collected data included some demographic information for the participant PCPs but no personal information of patients other than the inclusion criteria (women of childbearing age 14–46). PCP records were coded using unique and private identifiers. All data and findings collected from this QI project have been kept private, protected, and unidentified.

The data collected for this QI project allowed the principal investigator to identify patterns or trends in response to the multimodal intervention (Laerd Statistics, 2018). Descriptive data were used to evaluate whether the implementation of the PCP IPV educational session, EMR reminder alert, and EMR IPV screening tool increased,

decreased, or did not affect participating PCPs' IPV identification and screening rates in women of childbearing ages 14–46 at the PCF in Vancouver, BC.

Data Analysis Procedures

This section justifies how the data analysis aligned with the two clinical questions and was appropriate for the scholarly QI project design upon completion of the data collection and analysis. The goal of this analysis whether the implementation of the PCP IPV educational session, EMR reminder alert, and EMR IPV screening tool increased, decreased, or did not affect participating PCPs' IPV identification and screening rates in women of childbearing ages 14–46 at the PCF in Vancouver, BC. The data analyzed allowed the principal investigator to identify patterns or trends in response to the multimodal interventions (Laerd Statistics, 2018). The analysis of the data collected for this QI project was designed to answer the two clinical questions:

Q1: Does implementation of a PCP IPV educational session, an EMR reminder alert, and an EMR IPV screening tool increase IPV screening rates in women of childbearing ages 14–46?

Q2: Does IPV screening increase the rate of IPV identification in women of childbearing ages 14–46?

Data were collected on IPV screening and identification rates for female patients ages 14–46 of a nonrandomized set of 16 PCPs before and after the intervention. For each participating PCP, demographic information was collected during the multimodal intervention, including age, gender, position (general practitioner, registered nurse, or nurse practitioner), and work status (full-time, part-time, or casual). Screening data collected were entered into a spreadsheet using binary (1 = YES, 2 = NO) and count data. Data were collected for each participant PCP, with patients' data aggregated by the date

they were seen relative to the intervention. Charts reviewed in the pretest intervention period would be from days -30 to -1 (i.e., the 30 days before the intervention) and charts reviewed in the posttest period would be from days 1 to 30 (i.e., 1 day after the intervention to 30 days after the intervention). For all participating PCPs on each day of the pretest and posttest intervals, data were recorded on whether they were working that day, the number of women of childbearing age they provided care to, as well as the number of women screened and the number of IPV identifications made. This resulted in a complete dataset with PCP- and date-specific data that allowed the principal investigator to evaluate if the screening proportion varied over time or by PCP. The raw data as entered in the spreadsheet was imported into the R statistical environment for analysis (version 3.6.1; The R Foundation, n.d.-a; n.d.-b).

Initial analysis of the data collected consisted of descriptive statistics and exploratory plots to summarize the data collected. The demographic data of the participating PCPs was summarized by position as the average age, standard deviation of the age, percent female, and percent at each work status. These descriptive statistics capture the demographic traits of the participating PCPs. The data collected about the screening rates observed in the pretest and posttest intervals were summarized in tables and plots. Tables were used to capture the total number of female patients of childbearing age seen by participating PCPs during the pretest and posttest periods and what percent of these patients were screened for IPV. This table summarizes at a glance the results of the study regarding the first research question.

To visualize if the change in screening rates differed for each PCP, a line plot was created. This plot shows the change in each individual PCP’s screening rate from the pretest interval to the posttest interval. To visualize if the screening rates across all PCPs

changed with time during the pretest and posttest intervals, screening data were aggregated for each week of the study. A bar chart was then constructed where each bar represented a week, with different colored blocks to represent the proportion of patients screened, not screened, or with an IPV identification for the week. These tables and plots are the descriptive analysis for this study. All plots were created in R, using the ggplot2 package (Wickham et al., n.d.).

The next phase of the analysis for this study consisted of inferential statistics. Inferential statistics analyze data observed in a sample to try to draw conclusions about a population in general (Laerd Statistics, 2018). For this study, the principal investigator used two statistical tests to address the main research questions and assess whether the IPV screening rates after the administration of the multimodal intervention were higher than before the intervention. The two tests selected were a paired two-sample *z*-test of proportions and the paired Wilcoxon rank sum test. Both tests were conducted in a one-tailed fashion (i.e., assuming that the posttest screening rate would be greater than the pretest screening rate) with screening rates for each PCP paired in the pretest and posttest intervals. Paired tests were selected as the screening behaviors of a PCP may be influenced by that person's beliefs, values, or previous experiences, meaning that the pretest and posttest screening rates should be matched for each PCP during comparison (Laerd Statistics, 2018).

For both tests, the significance of the results was quantified using *p*-values. A *p*-value tests the null hypothesis, which is that the average of the difference of the pretest and posttest screening rates for all PCPs is equal to 0, indicating that the multimodal intervention had no impact on the screening rates. A *p*-value quantifies the statistical significance of the results by giving the probability that results observed would be

observed if the null hypothesis were true (Wilson, 2019). A lower *p*-value indicates less support of the null hypothesis, and for this study a significance level of .05 was selected as it is the typical cut-off in research for determining significance (Wilson, 2019).

The one-tailed two-sample *z*-test of proportions was applied to test for a difference in the overall screening and identification rate at the PCF between the pre- and postintervention periods. This tests the null hypothesis (that the average of the difference in pretest and posttest screening rates equals 0, indicating that the multimodal intervention had no impact). The two-sample *z*-test of proportions may result in unreliable *p*-values when one of the proportions is exactly or approximately equal to 0 (Wilson, 2019).

The principal investigator also performed a one-tailed paired Wilcoxon rank sum test to compare differences in the 16 PCPs' IPV screening rate between the pre- and postintervention periods. The paired Wilcoxon rank sum test also tests the null hypothesis that the average difference in screening rates between the pretest and posttest interval is equal to 0. This test is nonparametric, so it required fewer assumptions about the data, leading to more reliable *p*-values (Wilson, 2019).

Lastly, to address the second research question regarding the impact of the multimodal intervention on the identification of IPV, descriptive methods were used. For each interval, the rates of IPV identification were calculated, then these rates were compared. However, given the low incidence rate of IPV identification, it would not be prudent to perform a statistical test on this quantity of observations. The test would be underpowered, leading to unreliable results.

Results

The multimodal intervention was implemented on September 23, 2019, amongst 16 consented PCP participants at the primary investigator's PCF. From the preintervention period, a total of 244 charts for eligible patients of participating PCPs were reviewed. They were collected from a total of 186 PCP person days after accounting for vacation time and weekends. In the postintervention period, a total of 203 charts of eligible patients of participating PCPs were reviewed, collected from a total of 245 PCP person days (see Table 3).

Table 3

Results of Chart Review

QI study period	Total charts reviewed	Women screened		Women not screened	
		n	%	*n*	%
Preintervention	244	0	0%	244	100%
Postintervention	203	77	38%	126	62%

IPV screening rate results. The screening rate during the preintervention period was 0%. In contrast, the screening rate during the postintervention period was 38%. Examining these results further, findings suggest that different PCPs responded differently to the intervention: some PCPs achieved screening rates between 25% and 100% throughout the follow-up period, whereas others were unaffected by the intervention, resulting in a screening rate of 0 during the follow-up period. This indicates

that the effect of the multimodal intervention was highly variable depending on the PCP (see Figure 4). A few PCPs did not screen at all; their results align on the 0.00 line.

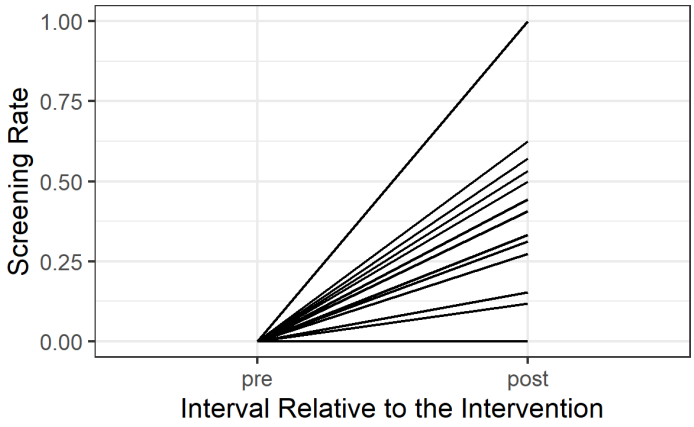

Figure 4. PCP participants' pre- and postintervention screening rates.

Examining the time trend, the screening rates remained high relatively consistently throughout the follow-up period (see Figure 5). This is a reassuring result as it indicates that the improvements in screening practices seen during the postintervention period may continue after the termination of this project.

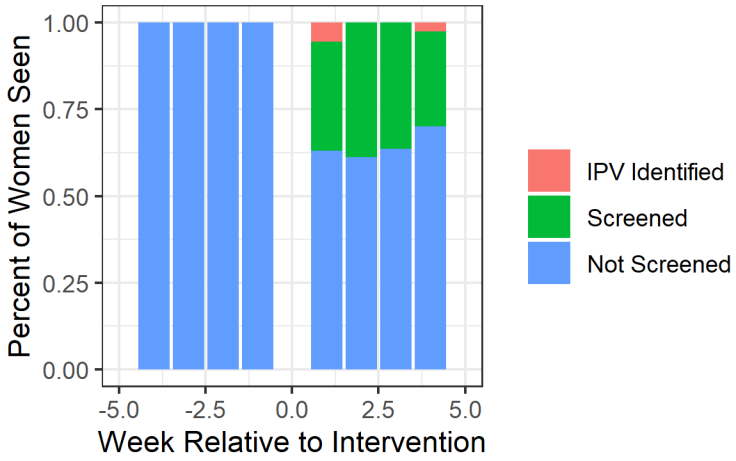

Figure 5. Screening rates relative to time.

To quantify the difference between the pre- and postintervention screening rates empirically, a one-tailed two-sample *z*-test of proportions was applied to test for a

difference in the overall screening rate at the PCF between the pre- and postintervention periods. The *z*-test shows that the postintervention screening rate is statistically significantly greater than the preintervention screening rate ($p < .001$, $\chi^2 = 109.17$). The principal investigator also performed a one-tailed paired Wilcoxon rank sum test. The one-tailed paired Wilcoxon rank sum test identified a statistically significant difference between the screening rates in the pre- and postintervention periods ($p < .001$, $V = 91$). Based on these two statistical tests, it can be concluded with confidence that the screening rates in the postintervention period were higher than the rates in the preintervention period.

IPV identification results. Addressing the second clinical question, regarding the rates of IPV identification, throughout the project only four positive identifications occurred. All four IPV identifications occurred during the postintervention period as result of screening. In the postintervention period, the overall incidence of IPV identification was 2%. Given the low incidence rate, it was not prudent to perform a statistical test on this quantity. However, it is promising that IPV identifications have occurred exclusively following the intervention.

Summary

Intimate partner violence is a serious health concern requiring ongoing screening efforts from PCPs. Screening amongst PCP within the primary care setting is rarely performed in Canada (Burczycka, 2016). In this QI project, a multimodal intervention was implemented to improve IPV screening rates for women of childbearing age (14–46) at a single facility in Vancouver, BC, Canada. Data were collected on the IPV screening rates for patients of a nonrandomized set of 16 PCPs before and after the intervention. This QI project received IRB approval and the multimodal intervention was subsequently

implemented amongst the voluntary participant PCPs at the PCF. The screening rate during the preintervention period was 0%, as none of the 244 eligible patients who sought care from participating PCPs were screened. In the postintervention period, the screening rate was 38% based on 203 eligible patients. The screening rate in the postintervention period was statistically significantly greater than the screening rate in the preintervention period according to both a one-tailed *z*-test of proportions ($p < .001$, $\chi^2 = 109.17$) and a one-tailed paired Wilcoxon rank-sum test ($p < .001$, $V = 91$). Throughout the project, only four IPV identifications occurred, all of which happened during the follow-up period. This number is too small for an empirical statistical test, but it does indicate that screening resulted in IPV identification. Chapter 5 discusses the two clinical questions and potential implications of disclosed data and data analysis. In addition, future implications on clinical and practical applicability with future research recommendations are discussed.

Chapter 5: Summary, Conclusions, and Recommendations

Intimate partner violence is a global problem that has many health costs to its victims and the health care system (CDC, 2017; Sprague et al., 2016). Intimate partner violence screening is recognized and strongly recommended by many authorities as an initial and essential approach in identifying and responding to victims of violence (Curry et al., 2018; Sprague et al., 2016). Despite evidence-based recommendations and global attention, many PCPs and organizations have yet to develop and implement IPV screening practices and policies. Screening has been shown to be useful for victim identification and in improving health outcomes in this at-risk population (Curry et al., 2018; O'Doherty et al., 2015). Screening is the first step in an IPV intervention process that can lead to IPV identification. However, PCFs in Canada have not widely adopted the recommended IPV screening practices. It is therefore important to understand how IPV screening practices might be improved in Canada to help identify and support victims of violence.

The purpose of this QI project was to improve IPV identification and screening while assessing the efficacy of a multimodal intervention to increase clinical practice compliance with the 2018 USPSTF's IPV screening practice recommendations for women of childbearing ages 14–46 in a Canadian PCF through the implementation of a same-day multimodal intervention. Early identification of IPV through screening is an important step in improving women's health outcomes (Curry et al., 2018). In 2017, the rate of police-reported IPV in Canada for women was estimated to be 487 per 100,000 (Burczycka, 2017). This is likely an underestimate of the true rate of IPV in women, but it provides some idea of the magnitude of the issue.

Prior research studies have demonstrated that increasing a health care provider's IPV knowledge, using electronic alerts, and including IPV screening tools within an EMR improved screening practices and identified victims of violence (Berger et al., 2017; Haegerich et al., 2015; Sawyer et al., 2016). Implementation of a PCP IPV educational session, an EMR IPV screening reminder alert, and an EMR IPV screening tool was used to increase IPV identification and screening rates in women of childbearing ages 14–46. Intimate partner violence screening in the primary care setting amongst PCPs is an essential step towards primary prevention. Primary care providers such as physicians, nurse practitioners, and registered nurses are in a unique position to improve health outcomes in women of childbearing age through IPV identification, with the adoption of IPV screening and use of evidence-based screening tools (Alvarez et al., 2017).

This QI project implemented an evidence-based IPV education session, adopted the verbal HITS IPV screening tool (Shakil et al., 2014) into an existing EMR, and used an EMR IPV screening reminder system in a small Canadian PCF. This intervention encouraged IPV screening amongst PCP participants through primary prevention screening of women ages 14–46 and led to identification of IPV during the project period. This QI project highlighted a gap and the importance of IPV screening while serving as a prompt for future research that further explores IPV screening practices and IPV identification within the Canadian health care system.

Summary of the Project

A quasi-experimental, quantitative, uncontrolled pretest–posttest methodology design was used to evaluate whether the implementation of a PCP IPV educational session, an EMR reminder alert, and an EMR IPV screening tool increased IPV

identification and screening rates amongst PCPs who cared for women of childbearing ages 14–46 in a single PCF in Vancouver, BV, Canada. This design was best suited to assess the efficacy of the multimodal intervention at identifying IPV and improving IPV screening rates at this PCF; this design is commonly used in QI projects (Portela et al., 2015). The following two clinical questions were examined in this scholarly QI project:

Q1: Does implementation of a PCP IPV educational session, an EMR reminder alert, and an EMR IPV screening tool increase IPV screening rates in women of childbearing ages 14–46?

Q2: Does IPV screening increase the rate of IPV identification in women of childbearing ages 14–46?

Nearly all PCPs at some point in their health care career will come across victims of violence (Sprague et al., 2016). Victims of IPV have poorer health outcomes compared to unabused women as they tend not to readily engage in consistent health care practices (Sprague et al., 2016). Intimate partner violence screening is strongly endorsed as an initial and vital method in recognizing and responding to victims of violence (Curry et al., 2018; Sprague et al., 2016). Screening in the health care setting by PCPs has been found to increase the identification of patients experiencing IPV (O'Doherty et al., 2015). Screening is the first step in an IPV intervention process towards primary and secondary prevention. This topic is discussed further following analysis of this QI project's findings.

Chapter 5 discusses the QI project's findings, draws conclusions, and outlines project implications that include practical, thematic, and future inferences through a retrospective analysis of the thematic framework. Strengths, weaknesses, and degree of credibility of this QI project as they relate to the methodology, design, and data are critically assessed and discussed. Recommendations for future scholarly work and

ongoing research efforts are provided. Lastly, the knowledge gained from this QI project, lessons learned, and how they might best be applied into current primary care settings is also discussed.

Summary of Findings and Conclusions

Findings demonstrate a statistically significant relationship between the variables in Q1 and only clinical significance in Q2. Using a one-tailed two-sample *z*-test of proportions ($p < .001$, $\chi^2 = 109.17$) and a one-tailed paired Wilcoxon rank sum test ($p < .001$, $V = 91$), Q1 postintervention results demonstrate an overall 38% increase in IPV screening amongst PCPs. It was found during the preintervention period that 0% of the 244 eligible female patients who sought care from participating QI project PCPs were screened. In the postintervention period, the screening rate was 38% based on 203 eligible patients. It was also found that the participant PCPs responded differently to the interventions in Q1. Some PCPs achieved screening rates between 25% and 100% throughout the 30-day follow-up period, whereas others were unaffected by the intervention, resulting in a screening rate of 0% during the follow-up period. This finding indicates that the effect of treatment was highly variable depending on the individual PCP. Nevertheless, the data indicate that the IPV screening rates in the postintervention period were higher than those in the preintervention period.

Q2 results demonstrate only clinical significance. IPV identification did occur during the QI project period, yet the number of identifications was small. As a result of the QI project's IPV screening, four positive identifications occurred during the postintervention period, with the overall incidence of IPV identification found to be 2%. Due to the low IPV identification incidence rate, further statistical testing was not conducted. However, clinical significance was demonstrated as IPV identification of four

female patients between the ages of 14 and 46 occurred exclusively following the intervention.

The following themes and subthemes presented in Chapter 2's literature review supported Q1 and Q2 in this QI project: (a) primary prevention screening for IPV, including IPV screening tools, barriers to IPV screening, and patient benefits of IPV screening; and (b) improving provider awareness, including burden of disease, IPV education, and EMR tools for support. Findings from this QI project in relation to the applied themes, a reflection of this project's significance and advancement of scientific knowledge as discussed in Chapter 1, are further discussed in the subsections that follow.

Primary prevention screening for IPV. Screening for IPV within the U.S. health care setting is recommended by the Institute of Medicine, USPSTF, and many other leading national health care organizations (Miller et al., 2015). Despite IPV being one of the most common forms of violence in Canada, IPV screening recommendations from the USPSTF were not endorsed by the Canadian Task Force on Health Care (Canadian Task Force on Preventive Health Care, 2013; Verma & Maleki, 2016). As such, there are currently no evidence-based guidelines or clinical recommendations for IPV screening for women aged 14–46 in Canada. In addition, the implementation of an IPV education session, use of the HITS screening tool, and an EMR alert system have all been shown in the literature to improve providers' IPV screening practices (Onders et al., 2014; Shakil et al., 2014; Sprague et al., 2018). Using the 2018 USPSTF IPV screening recommendations specifically in women, and previous research on supports such as education and EMR, Q1 was developed. The QI project's Q1 was developed to determine if an IPV educational session, an EMR reminder alert, and an EMR IPV screening tool increased IPV screening rates amongst PCPs who provided care for women ages 14–46.

Project results for Q1 show a significant statistical difference between preintervention screening rates (0%) and postintervention screening rates (38%) using a one-tailed two-sample *z*-test of proportions ($p < .001$, $\chi^2 = 109.17$) and a one-tailed paired Wilcoxon rank sum test ($p < .001$, $V = 91$). The use of EMR supports such as alerts and templates has been shown in previous research to improve IPV screening adherence. The QI project results support previous research in this regard. Increasing knowledge about IPV through education, the implementation of an EMR alert, and the HITS screening tool into a health care setting has been shown to help identify victims of violence in this project and elsewhere (Bae et al., 2018; Carey et al., 2015; Onders et al., 2014). These findings highlight the importance of IPV education and EMR supports to prompt PCPs to screen for IPV; use of such supports and targeted education could help improve providers' confidence, familiarity, and use of IPV screening tools.

Improving provider awareness. The importance of capturing IPV prevalence rates continues to be well reported and researched in the literature (Spivak et al., 2014; Widom et al., 2014). Q2 of the QI project was developed as PCPs are in an excellent position to create and maintain trusting relationships to address IPV, thus leading to identification of IPV within the health care setting. Research has indicated that IPV awareness within the health care setting is lagging and much is needed to improve it (Leppäkoski et al., 2014). Attention to improving providers' awareness of IPV starts with understanding the burden of disease, providing IPV education and local resources, and positioning supports through EMR systems. In addition, the verbal HITS IPV screening tool has been demonstrated to be a valid screening tool for women in the family practices setting for identifying IPV victims (Shakil et al., 2014). Through provider awareness,

victims of violence can receive individualized and tailored intervention strategies that best address their needs (Macy et al., 2018).

Four women in this QI project's postintervention period were identified for IPV. Thus, Q2 was found to have clinical significance but not statistical significance. This was similar to findings reported by Smith et al. (2015) that approximately one in four women will report IPV within their lifetime. As a result of this QI project's IPV screening, these four IPV identifications were found. In contrast, there was no IPV identification identified preintervention. In the postintervention period, the overall incidence of IPV identification was 2%. Given the low incidence rate, it would not be prudent to perform a statistical test on this quantity. However, it is clinically significant that IPV identifications did occur following the intervention.

Intimate partner violence is significant as almost all professionals in health care come across victims of violence during their health care career (Sprague et al., 2016). Without identification of IPV through screening, victims suffer in silence, with many potential physical and mental health consequences. Screening is nationally recognized and strongly recommended as an initial and vital method in identifying and responding to victims of violence (Curry et al., 2018; Sprague et al., 2016). Projects such as QI initiatives are imperative in developing health care system practices through examining evidence-based applications, improving health outcomes, and keeping providers' clinical practice up to date (Silva et al., 2016). The benefits of IPV screening in women of childbearing age have been demonstrated, yet the adoption of screening in the health setting amongst PCPs remains disturbingly low (Curry et al., 2018). Increasing Canadian clinical practice compliance with the 2018 USPSTF's IPV screening practice recommendations for women of childbearing age was identified as a necessary QI step in

order to identify IPV and intervene at the principal investigator's clinical practice setting. Screening leads to IPV identification and is essential in reducing future IPV, improving physical and mental harms, and decreasing mortality rates amongst women (Curry et al., 2018).

Implications

This section describes what could occur because of this QI project. It addresses what the QI project implies theoretically, practically, and for the future. A retrospective examination of the two theoretical frameworks that were presented in Chapter 2 is included. As well, this section critically evaluates the strengths and weaknesses of the QI project, and the degree to which the conclusions are credible given the chosen methodology, design, and collected data.

Theoretical implications. The two theoretical foundations used for this QI project were the theory of reasoned action and game theory. Both of these theoretical foundations were used in order to better understand and enact changes that could improve IPV screening at the PCF as participant PCPs were required to adopt new screening processes and use EMR support systems. The theory of reasoned action was used to identify potential barriers to PCPs either not wanting to participate in the QI or not screening female patients between the ages of 14 and 46. During the IPV QI project, participants' attitudes and behaviors regarding IPV and screening were discussed amongst other participants. The theory of reasoned action explains the PCPs' actions by exploring their behaviors and attitudes regarding IPV: a PCP participant with stronger intentions had a higher likelihood of performing the required behavior (Fishbein, 2008). It was found that the stronger the intention of the PCP participant, the higher the

probability that PCP would screen women aged 14–46 who attended the PCF during the QI period.

The theory of reasoned action was relevant in this QI project as no male PCPs demonstrated interest in or participated in this QI project. One male PCP wrote, “This is very gender biased screen using he. My psychologist patient presented to the Federal Senate that his research shows women abuse men more than the opposite” (personal communication, October 23, 2019). In contrast, three female PCPs who expressed additional vested interest in IPV screening had the highest postintervention IPV screening rates. Health promotion and prevention activities such as screening are important for PCPs caring for female clients who access care within the PCF, as there is a small window of opportunity.

Game theory was used to understand the potential outcomes of interactions between the female patients who were screened for IPV and the participant PCP. During the IPV education session, IPV verbal scripts leading into the screening questions were supplied, practiced, and discussed amongst participant PCPs. Game theory was further used to role-play interactions between the female patient and the participant PCP during the IPV education session. This theory was useful during the IPV education session as it explored the potential social interaction and outcome between the IPV screener and the patient (Soonok et al., 2016). Incorporation of this theory into the IPV education session was essential in providing the participant PCP with confidence and practice in what and how to start the IPV screening conversation with female patients.

Some PCP participants expressed initially feeling uncomfortable about asking IPV screening questions or starting the conversation. Use of the verbal script examples and role playing was instrumental in addressing these potential barriers. Some participant

PCPs had previous experience in IPV screening and shared some of their personal successes and failures during the IPV education session. Several PCPs who actually identified IPV in women through screening came to speak to the principal investigator. They reported being “shocked” at the identification yet were happy that the process was easier than they had originally thought the conversation would be. One PCP participant shared how a female patient was thankful for being screened: although she was not at risk, she felt this would help another woman in need. Game theory aided in recognizing and describing strategic interactions and the associated outcomes of these interactions between the female patients and the participant PCPs during the QI period.

Practical implications. Practical implications from this QI project could help strengthen and advance the adoption of and improve adherence to the 2018 USPSTF IPV screening recommendations in primary health care settings across Canada. Health outcomes can be improved with early identification of IPV in the health care setting when PCP engage in robust screening practices (Curry et al., 2018). Due to the dramatic increase in IPV screening rates postintervention (from 0% to 38%) and the identification of IPV in four female patients between the ages of 14 and 46, continued screening at the current PCF is important. The development of a clinical practice guideline and organizational policies in regard to ongoing IPV education, use of screening tools, and use of EMR supports for screening would be applicable and innovative in this practice setting. Furthermore, the initiation and development of IPV screening practices and support at additional PCF locations is recommended. Future implications involve igniting the significance and importance of IPV screening within the Canadian health care setting through the creation of national standards and evidence-based IPV screening guidelines.

Future implications. This QI project assisted in supporting PCPs by keeping their practice up to date and evidence-based. It also potentially improved the health outcomes of female patients found to be positive for IPV. A British Columbia primary care IPV screening toolkit could be created and used at other PCF locations to improve IPV screening awareness and practices. Toolkits provide evidence-based research, strategies, and useful supports to PCPs working in the health care setting. In addition, future QI projects could explore barriers to IPV screening, further explore the worth of each multimodal intervention separately, and examine longitudinally the health outcomes of female patients who are found to have a positive IPV screen. Intimate partner research in Canada is scarce, with most of the research being conducted in the U.S. More importantly, females are not the only at-risk population to IPV. Future research could look at other at-risk populations such as men, transgendered individuals, and the elderly. Health care settings should have routine IPV screening practices that could potentially identify IPV regardless of age or gender.

Weaknesses and strengths. This QI project had several areas of weakness, which included a prescribed postintervention time frame of 30 days. Had that period been longer, it is possible that more women with IPV would have been screened and identified. Moreover, the IPV screening education session was offered only during a single lunch hour one day of the week. It was noted that some PCPs did not work on Mondays and therefore were not eligible to participate although they were willing. In addition, other opportunities could have been explored for IPV screening aside from in-person visits. This PCF has multiple different methods with which providers engage or communicate with their patients, including phone calls and emails. The IPV screening reminder that was initiated into the current EMR system was found at times not to be present in

applicable female patients' charts. Having this reminder present in these female patients' EMR charts could have led to IPV screening and identification. Instead, these patients were counted as eligible females who were not screened during the QI project. A final weakness was that no male PCPs participated in this QI project. Having had male participants could have led to a greater understanding and applicability of both theories that were used.

Strengths of this QI project included the sample size (N = 16) comparative to the total number of employed PCPs (N = 27) at this one PCF location. No errors were found or reported during data collection or upon further analysis. Most of the participants in this QI project were engaged during the QI project period, and the screening rates for some rose dramatically (75%–100%). Participants also shared their IPV identification successes amongst one another, and some sent their appreciativeness of this QI project in writing to the principal investigator. Strengths also included the PCF in which the QI project was implemented: the organization was extremely supportive and quick to create and deploy the EMR supports, such as the IPV screening tool and EMR screening alert, into the existing EMR system. This technical aspect potentially could have been a barrier and hindered the multimodal approach that was deployed. Lastly, participant PCPs expressed their satisfaction with the embedded IPV screening tool and ease of use during the QI project. The verbal HITS screening tool that was used with permission has been validated in the primary care setting (Sherin et al., 1998).

Conclusions. In conclusion, data in this QI project in response to Q2 were found to be clinically significant, and data for Q1 were found to be statistically significant. Results were analyzed using a quasi-experimental, quantitative, uncontrolled pretest–posttest methodology design that evaluated whether the implementation of a PCP IPV

educational session, an EMR reminder alert, and an EMR IPV screening tool increased IPV identification and screening rates in women of childbearing ages 14–46. Statistical testing using a one-tailed two-sample *z*-test of proportions was applied to test for a difference in the overall screening rate at the PCF between the pre- and postintervention periods, and a one-tailed paired Wilcoxon rank sum test was used to identify statistically significant differences between the screening rates in the pre- and postintervention periods. Due to the small sample size, nonrandomization of participants to the intervention, and the multimodal approach, these results are limited. It is not known if one intervention (IPV screening tool, IPV education, or EMR IPV screening reminder) proved more efficient than the others. Future validity of this QI project's findings could include using a larger sample size, extending the postintervention time up to 6 months, randomizing participants, and separating the multimodal interventions.

Recommendations

Intimate partner violence is a serious health concern in Canada that needs to be addressed. PCPs working in the health care setting are at the forefront of leading change through the adoption of IPV screening practices despite the lack of support from the Canadian Task Force on Health Care, lack of evidence-based guidelines, or national policies addressing the need for IPV screening. It is recognized in the clinical practice setting as a best practice that IPV screening be provided by all primary health care providers (Currey et al., 2018). However, IPV screening is not regularly performed in Canada. The QI project's data have been summarized and the findings are complete, with a summarization of recommendations for future projects and recommendations for practice.

Recommendations for future projects. Future projects that address IPV screening practices could include additional health care providers who have contact with patients in a variety of different settings and roles, such as psychologists, pharmacists, laboratory technologists, or dietitians. Screening for IPV is the responsibility of all health care professionals who have contact with patients, so it is appropriate to expand future projects to include additional health care professionals. Further exploration into a variety of interventions that improve IPV screening amongst health care professionals or evaluating the multimodal intervention of IPV education, EMR IPV screening alert, and an embedded IPV screening template independently, could lead to a better understanding of which intervention improved IPV screening practices the most. The use of alternative study methodologies and designs could include the addition of a control group, a randomized sample, or a different sample population of PCPs and patients, which may yield different results. A multivariate analysis could be used to identify explanatory factors for differences in data findings. As this was a small sample size in a small, private health care facility, future reproduction of this QI project in another larger primary care facility could support improved validity and generalizability. Lastly, according to one nonparticipant's email correspondence that gender biases are prevalent in IPV screening, future research that addresses gender biases and encourages IPV screening in men is strongly encouraged. Smith et al. (2015) reported that one in 10 men will report IPV within their lifetime.

The next step for improving PCPs' adherence to the 2018 USPSTF IPV screening recommendations within the clinical practice setting is through the translation of the

knowledge gained through this QI project and the dissemination of the project's findings. The primary investigator plans to present the QI project's findings to the PCF's senior leadership and health care team in hopes of further and continued adoption of IPV screening practices at their current and additional locations. In addition, the QI project findings will be submitted to several Canadian medical journals in anticipation of improving IPV awareness and screening practices in Canada, highlighting this QI project's significance in advancing scientific knowledge.

Recommendations for practice. Three recommendations for future practice based on the results and findings from this QI project are presented. In addition, an explanation as to why each recommendation was made is included.

- As IPV education can positively impact IPV screening rates and awareness amongst PCPs, it is recommended that IPV education and training be mandatory and provided to all health-related staff every year regardless of practice setting or type. Training would be best offered with use of an evidence-based IPV screening toolkit or a trained professional. This approach would ensure that evidence-based practice is kept up to date and screening practices are renewed while local resources and supports are revised.
- It is recommended that an evidence-based Canadian IPV educational toolkit be developed that could provide additional support and serve as a national standard of reference. The toolkit should incorporate role-playing exercises and IPV screening scripts to add to user confidence. Toolkits are an excellent

way of providing evidence-based education, hands-on training opportunities, national resources, and supports.

- Finally, it is recommended that a BC IPV screening guideline for use in the primary care practice setting be created. Clinical practice guidelines are created from a review of current evidence with an evaluation of potential benefits and harms. Such information could be used to optimize care for women at risk of IPV and support health care professionals to screen for IPV (Kredo et al., 2016). A BC clinical practice guideline could provide additional support and guidance to PCPs to improve screening practices within the primary care setting. Furthermore, the creation of a screening guidelines would draw much-needed attention to IPV in BC.

These clinical practice recommendations are based on the positive outcomes and findings from this QI project on IPV screening and identification. Findings from this QI project demonstrate that IPV education, an EMR IPV screening alert, and use of an EMR embedded HITS verbal screening tool led to improved screening practices among women ages 14–46. Furthermore, the intervention led to the identification of IPV in this select sample population of women. Therefore, the primary investigator concludes that such interventions can lead to improved IPV screening practices amongst PCP and ultimately identify IPV in the primary care setting. As previously discussed, IPV education and use of various EMR support systems such as alerts and templates are instrumental in improving IPV screening adherence among PCPs (Bae et al., 2018; Carey et al., 2015; Onders et al., 2014). Improving screening practices can lead to earlier IPV detection, prevent further abuse, and enhance health outcomes (Curry et al., 2018; O'Doherty et al., 2015). User-friendly evidence-based IPV screening templates and screening alerts can

easily be adopted into EMR systems without cost burden or decreased user ability. The USPSTF recommends routine IPV screening for all women of childbearing age, 14–46, using an evidence-based IPV screening tool.

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Appendix A: The Verbal Hurt Insult Threaten Scream Screening Tool

The Verbal HITS* Screening Questions
1. Does your partner physically **H**urt you? *Yes or No*
2. Does he **I**nsult you or talk down to you fairly often? *Yes or No*
3. Does he **T**hreaten you with harm? *Yes or No*
4. Does he **S**cream or curse at you fairly often? *Yes or No*
Total # of Yes Answers: __/4

* The patient answers "yes" or "no" to each question. ***A "yes" to one or more questions classifies the patient as a positive screen.*** Answering "no" to all of the items renders a negative screen. The items can be remembered by the acronym HITS.

Appendix B: Permission to Use Verbal Hurt Insult Threaten Scare (HITS) Screening Tool

From: Kevin Sherin <kshcrin@yahoo.com>
Sent: Tuesday, July 2, 2019 1:48 PM
To: ANJIE GIBSON
Subject: Copyright Confirmation

Hi Anjie,

As a DNP candidate, here is my written permission to use the HITS tool in whatever format suits your clinic for your doctoral work and research period. This permission extends to the completion of your DNP project.

If the clinic at Vancouver intends to permanently use the tool and embed it in EHR then a separate license agreement should be done later with the clinic contracts manager. The HITS tool has a nominal US copyright fee but as a student you are not liable for that.

The HITS tool, written and verbal, and EHITS are evidence-based tools listed in the USPSTF 2018 statement. High fidelity training is advised to build ongoing systems of supportive care and interventions as recommended in the 2018 statement below. The US Veterans Administration government health system and the Nurse Family Partnership of Denver, both have model trainings for implementing screening using the HITS tool and for follow up care.

https://www.uspreventiveservicestaskforce.org/Page/Document/RecommendationStatementFinal/intimate-partnerviolence-and-abuse-of-elderly-and-vulnerable-adults-screening1

Kevin Sherin MD, MPH, MBA
Sent from my iPhone

Appendix C: Permission to Use Clinical Summary on Intimate Partner Violence Screening

SCREENING FOR INTIMATE PARTNER VIOLENCE AND ABUSE OF ELDERLY AND VULNERABLE ADULTS

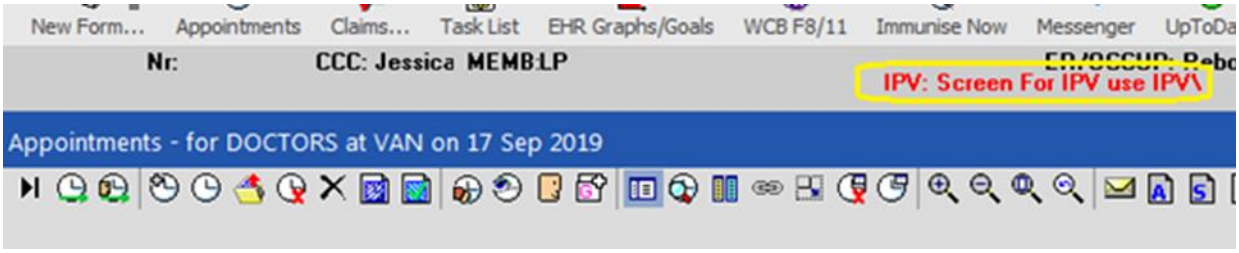
CLINICAL SUMMARY OF U.S. PREVENTIVE SERVICES TASK FORCE RECOMMENDATION

Population	Asymptomatic women of childbearing age	Elderly or vulnerable adults
Recommendation	**Screen women for intimate partner violence (IPV), and provide or refer women who screen positive to intervention services. Grade: B**	**No recommendation. Grade: I**
Risk Assessment	While all women are at potential risk for abuse, factors that elevate risk include young age, substance abuse, marital difficulties, and economic hardships.	
Interventions	Adequate evidence from randomized trials support a variety of interventions for women of childbearing age that can be delivered or referred by primary care, including counseling, home visits, information cards, referrals to community services, and mentoring support. Depending on the type of intervention, these services may be provided by clinicians, nurses, social workers, non-clinician mentors, or community workers.	
Balance of Benefits and Harms	Screening and interventions for IPV in women of childbearing age are associated with moderate health improvements through the reduction of exposure to abuse, physical and mental harms, and mortality. The associated harms are deemed no greater than small. Therefore, the overall net benefit is moderate.	The USPSTF was not able to estimate the magnitude of net benefit for screening all elderly or vulnerable adults (i.e., adults who are physically or mentally dysfunctional) for abuse and neglect because there were no studies on the accuracy, effectiveness, or harms of screening in this population.
Other Relevant USPSTF Recommendations	The USPSTF has made recommendations on screening for depression in adults and screening and counseling to reduce alcohol misuse in adults. These recommendations are available at http://www.uspreventiveservicestaskforce.org/.	

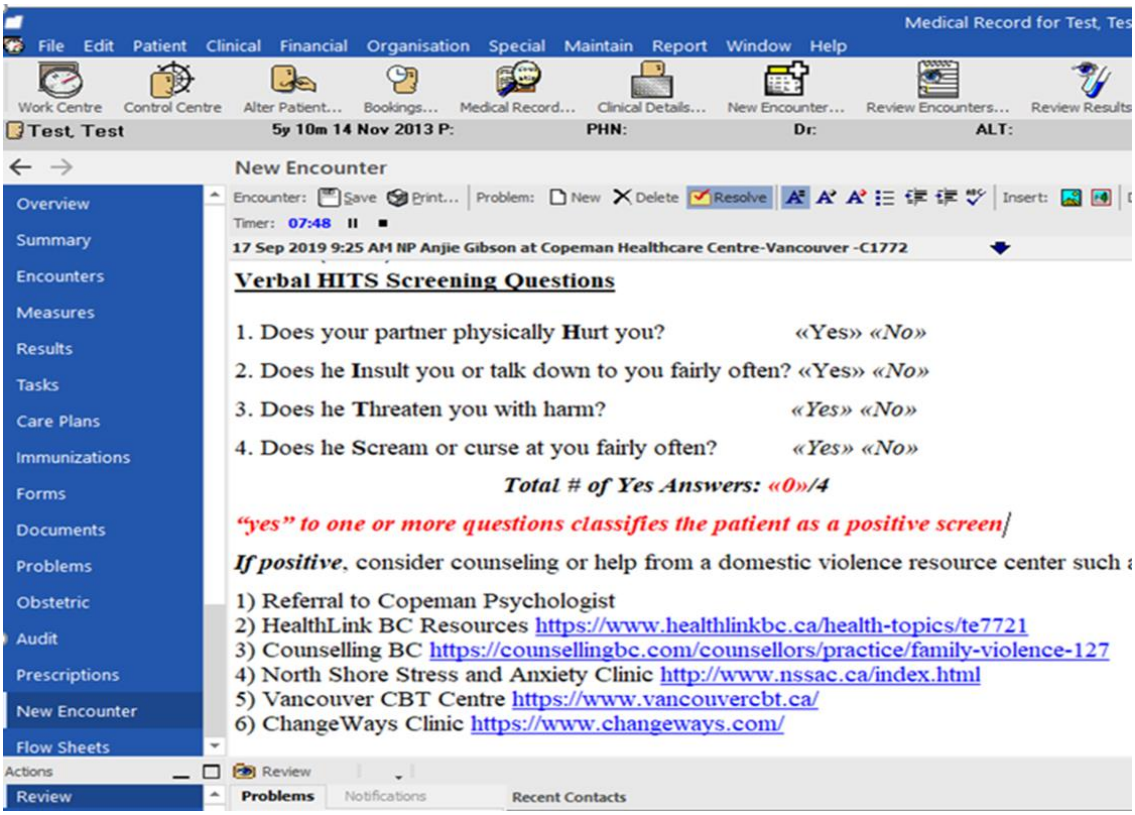
d: Clinical Summary

Clinical summaries are one-page documents that provide guidance to primary care clinicians for using recommendations in practice. This summary is intended for use by primary care clinicians.

Appendix D: EMR IPV Screening Alert



Appendix E: EMR IPV Screening Template



Appendix F: IRB Approval

DATE: September 16, 2019

TO: Angela Gibson

FROM: COLLEGE OF NURSING AND HEALTH CARE PROFESSIONALS

STUDY TITLE: Cultivating Intimate Partner Violence Screening in the Primary Care Setting: A Quality Improvement Project

ACTION: DETERMINATION OF QUALITY IMPROVEMENT/PROGRAM EVALUATION STATUS

DATE: September 16, 2019

REVIEW CATEGORY: QUALITY IMPROVEMENT/PROGRAM EVALUATION

In collaboration with the Institutional Review Board, The College of Nursing and Health Care Professions at Grand Canyon University has determined that this submission does not meet the definition of human subject research. The submission qualifies as Quality Improvement and/or Program Evaluation; therefore, further IRB review is not required. In future publications and/or presentations, please refer to this submission as Quality Improvement and/or Program Evaluation, not research. If the results of the project will not be published, presented, or disseminated outside of the institution, ensure that all those associated with the project are aware that the project is ongoing.

We will put a copy of this correspondence in your student file in our office. If you have any questions, please contact The DNP Program Lead Faculty, Dr. Amanda Ziemendorf in the College of Nursing and Health Care Professions, Amanda.ziemendorf@gcu.edu.

Please include your study title and reference number in all correspondence with this office, IRB@gcu.edu.